January 1946

TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office



technology
review
Published by MIT

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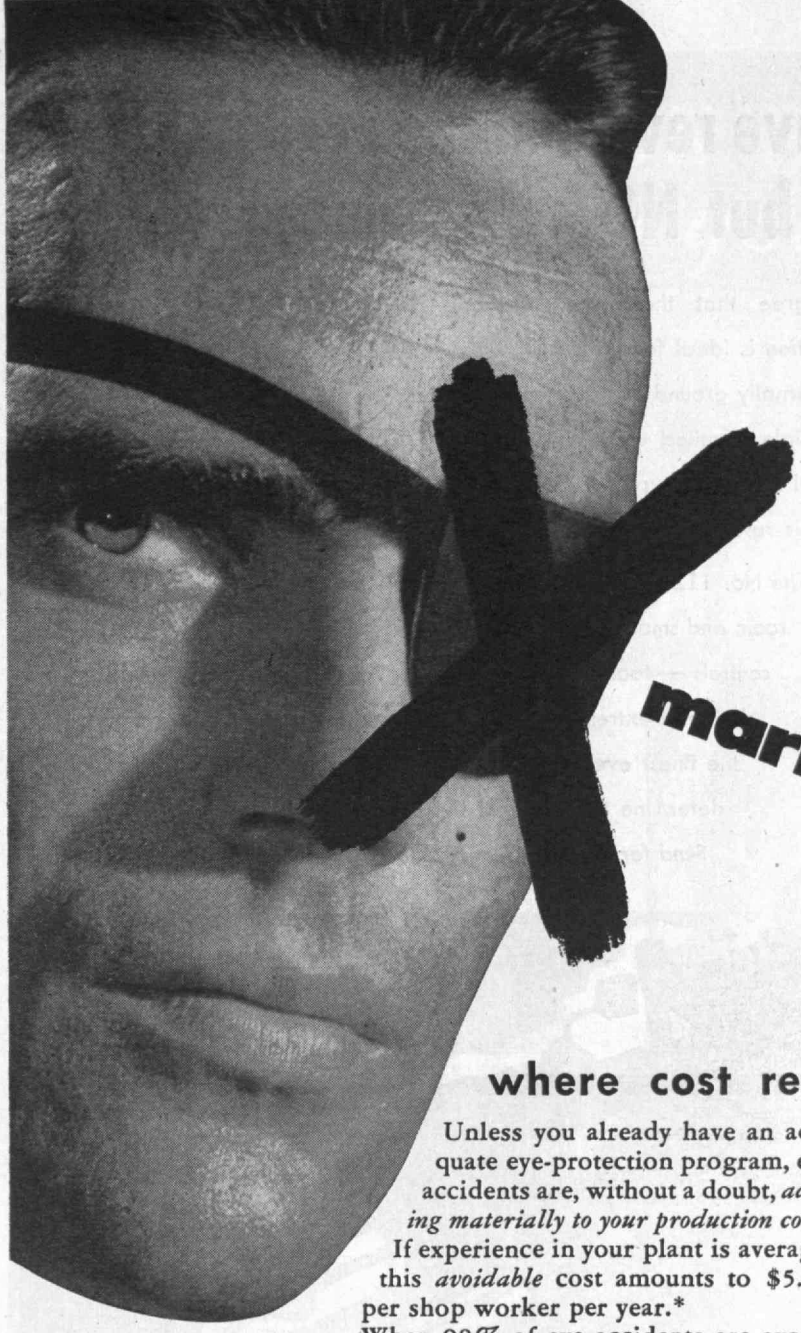
THE HARVEY METAL CORPORATION

HAROLD B. HARVEY '05 • *Engineers & Manufacturers* • SHERRY O'BRIEN '17

74th STREET and ASHLAND AVENUE • CHICAGO 36, ILLINOIS

FORGINGS IN ALUMINUM • BRASS • BRONZE • COPPER • MAGNESIUM • MONEL • ALLOYS

MACHINING FACILITIES



marks the spot

where cost reduction programs suffer

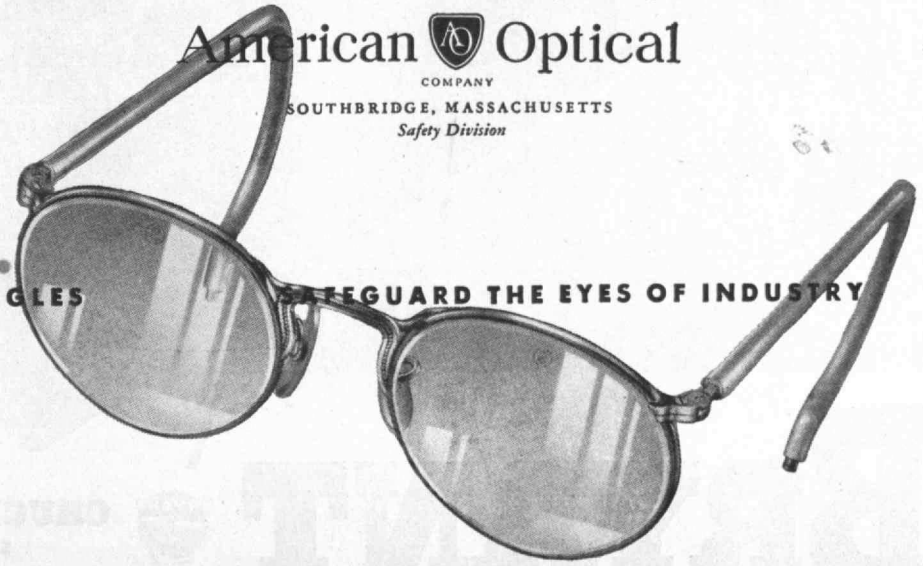
Unless you already have an adequate eye-protection program, eye accidents are, without a doubt, *adding materially to your production costs.* If experience in your plant is average, this *avoidable* cost amounts to $5.00 per shop worker per year.*

When 98% of eye accidents are avoidable* — at a cost for safety goggles of only about $1.50 per man — why let this waste continue?

Your nearest AO Safety Representative will be glad to arrange for a complete eye hazard survey of your plant without cost or obligation.

*Estimated by the Society for the Prevention of Blindness.

American Optical
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AO SAFETY GOGGLES SAFEGUARD THE EYES OF INDUSTRY

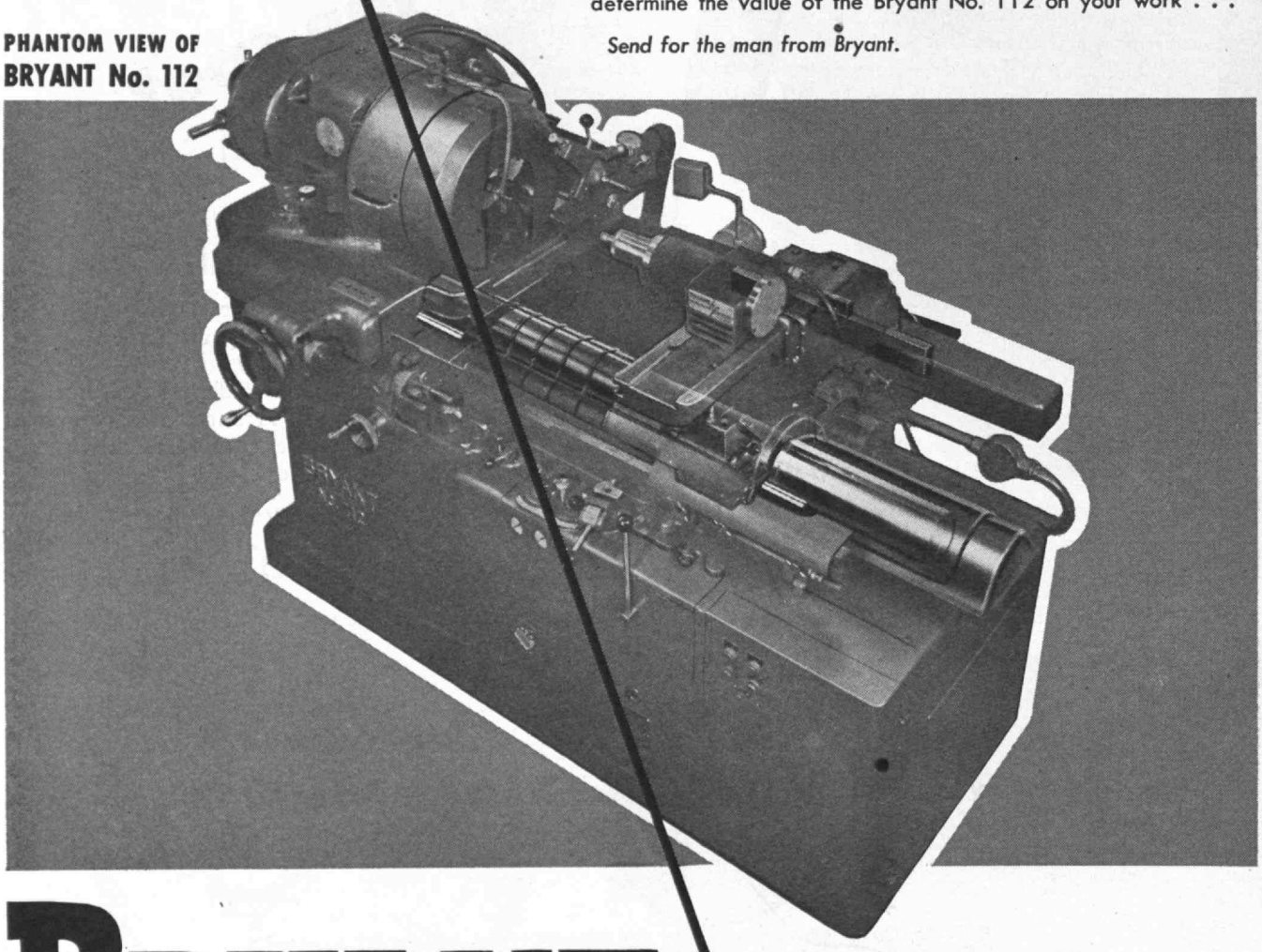
THE TECHNOLOGY REVIEW, January, 1946. Vol. XLVIII, No. 3. Published monthly from November to July inclusive at 10 Ferry Street, Concord, N. H. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription $3.50; Canadian and Foreign subscription $4.00. Entered as second-class matter at the Post Office at Concord, N. H., under the Act of March 3, 1879.

We have reversed the design . . . but NOT the principle

Users agree that the Bryant principle of *cylindrical slide construction* is ideal for the fast, precise, economical production of internally ground parts. Bryant engineers knew that this same principle, applied *under the work head*, would be more practical for certain types of jobs. The result was the Bryant No. 112. This result has been *tested and proved* for the past five years.

The No. 112 is the last word for the internal grinding of tool room and small lot parts. It is designed with simple, concentrated controls — tooling and fixtures may be changed quickly — production is extremely fast — accuracy and work finish are among the finest ever produced by any grinder of any type. To help determine the value of the Bryant No. 112 on your work . . . *Send for the man from Bryant.*

PHANTOM VIEW OF BRYANT No. 112



BRYANT

CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

Let NORTON RESEARCH *help you . . .*

RECONVERT with NORTON

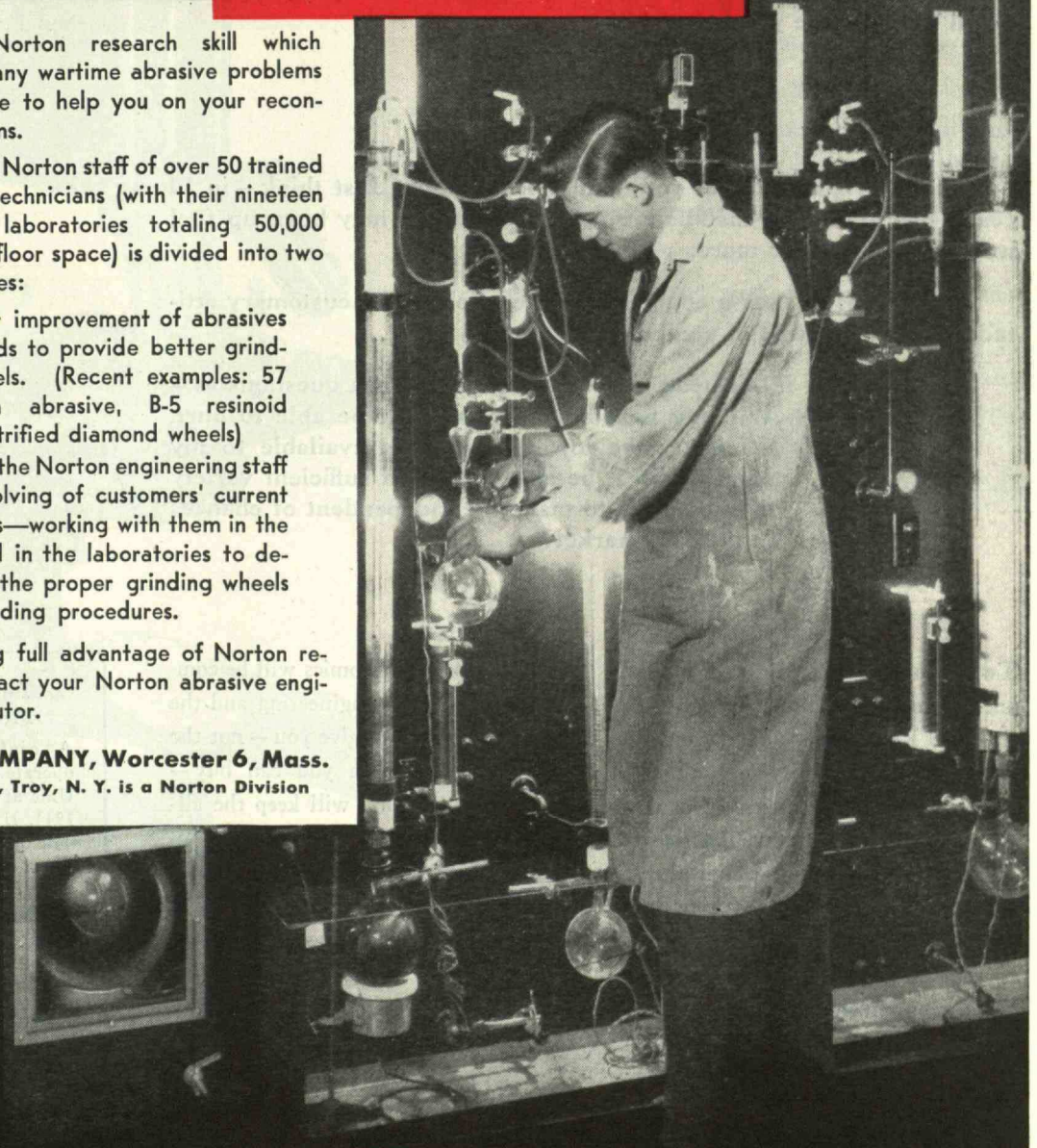
THE same Norton research skill which solved so many wartime abrasive problems is now available to help you on your reconversion problems.

The work of the Norton staff of over 50 trained scientists and technicians (with their nineteen well-equipped laboratories totaling 50,000 square feet of floor space) is divided into two important phases:

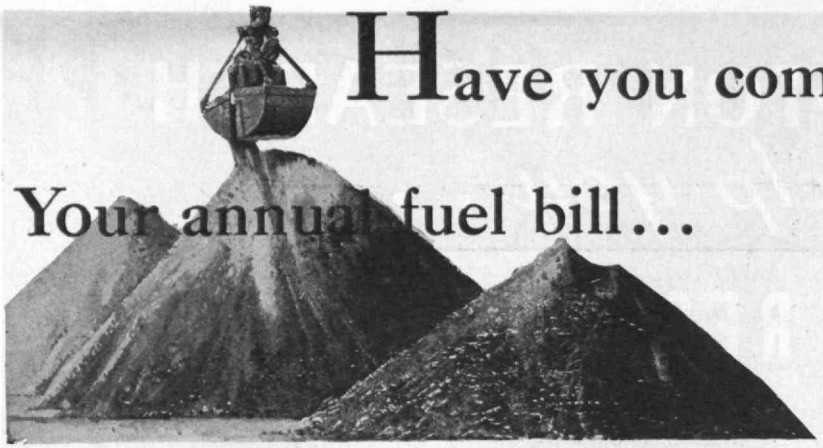
1. Constant improvement of abrasives and bonds to provide better grinding wheels. (Recent examples: 57 Alundum abrasive, B-5 resinoid bond, vitrified diamond wheels)
2. Helping the Norton engineering staff in the solving of customers' current problems—working with them in the field and in the laboratories to determine the proper grinding wheels and grinding procedures.

Are you taking full advantage of Norton research? Contact your Norton abrasive engineer or distributor.

NORTON COMPANY, Worcester 6, Mass.
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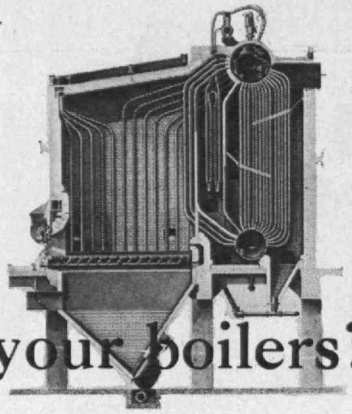


NORTON ABRASIVES



Have you compared...

Your annual fuel bill...



with the original cost of your boilers?

If you do compare – and your operation is anyway typical – you'll find a single year's fuel bill is –

nearly as much as,
equal to,
or greater than

– the total original cost of your boiler installation. Just think – in 10 years' operation – an installation costing $50,000.00 may burn up fuel worth $500,000.00, or more.

Doesn't such a comparison give a jolt to the customary attitude toward first cost of equipment?

Doesn't it – instead – focus attention on such questions as – Will my next boiler installation be able to burn *efficiently* the lowest cost coals available to my plant? Will it be able to burn a sufficient variety of such coals to make me independent of changes in the coal market?

Two actual examples – many similar ones are on record – are described in the box. Read them, and if you are approaching the time when you will need a new boiler, consult C-E where you will find (1) a viewpoint that is concerned primarily with high return on your investment in terms of low annual fuel cost, and (2) a line of equipment adequate for any fuel or steam requirements.

Thus sound economics will be combined with sound engineering and the right equipment to give you – not the cheapest installation you can buy – but rather one that will keep the all-important fuel bill down to a minimum. With present high fuel prices and no prospect of post-war reduction, such an installation now offers the opportunity of greater economies than ever before.

A-907-A

TWO EXAMPLES TO PROVE THE POINT

A confectionery manufacturer operated a medium sized C-E Unit at moderate rating during 1944. His fuel cost was $32,000. The original cost of the unit was $30,061.

A Paper Company operating a larger unit under continuously heavy load through the same period paid $137,250 for coal. The cost of the equipment was $66,000.

COMBUSTION ENGINEERING

200 MADISON AVENUE • NEW YORK 16, N. Y.

BAUSCH & LOMB MICROSCOPE

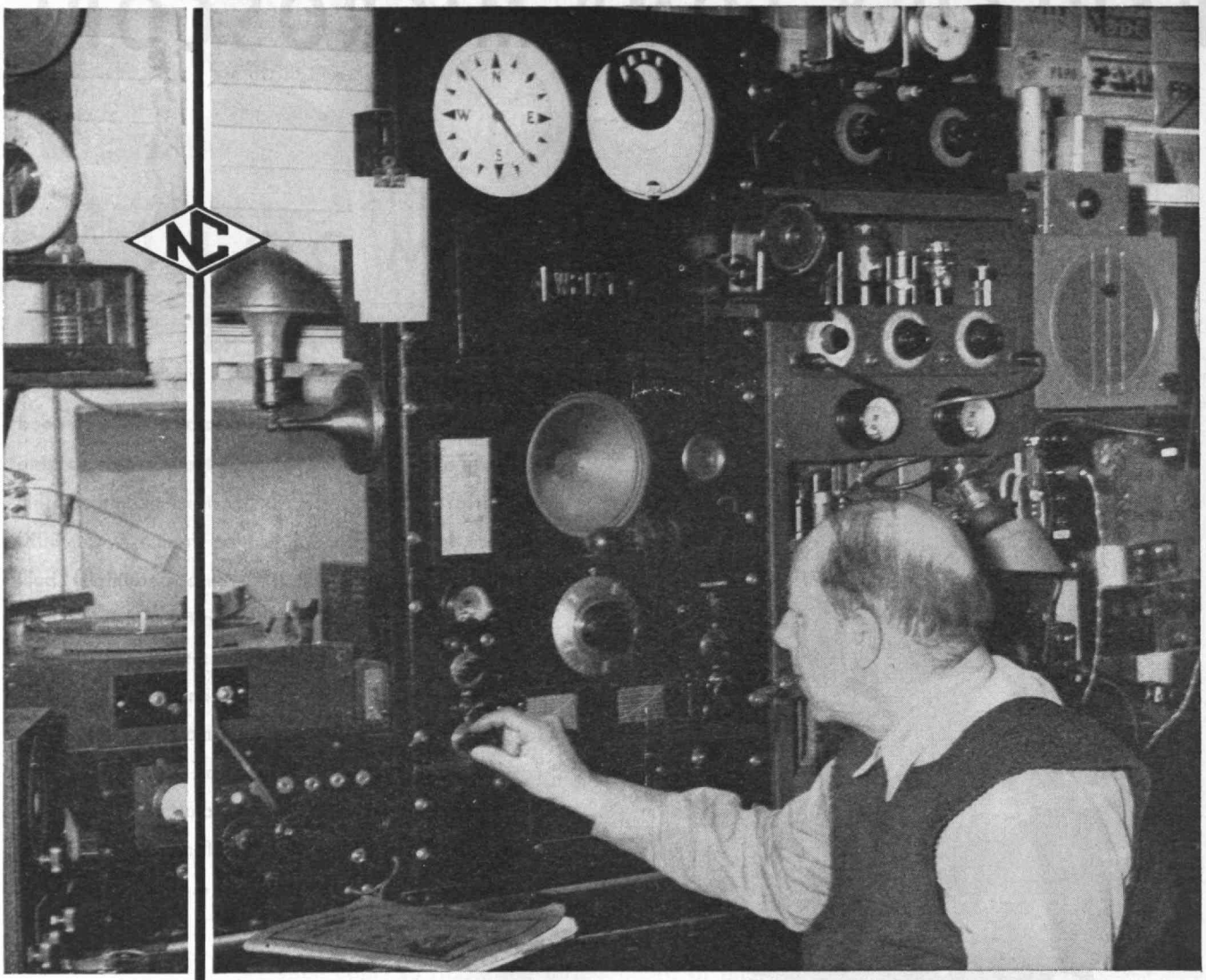


MODEL BA-8

The B series of Bausch & Lomb Microscopes is planned optically and mechanically to meet the greatest possible number of uses with a standard instrument. In weight, in balance, in range of magnification (from 20X to 980X) and in accessories available, these beautifully built microscopes give you a precision instrument that's truly versatile. Model BA-8 has built-on mechanical stage of improved design. An Abbe Condenser, 1.25 N.A., is held in a full-ring mount. Positive, smooth focusing is accomplished through rack and pinion coarse adjustment and B&L patent lever-type fine adjustment, with automatic take-up for wear. Write for Catalog D-185, "Laboratory Microscopes." Bausch & Lomb Optical Co. Rochester 2, N. Y.

BAUSCH & LOMB

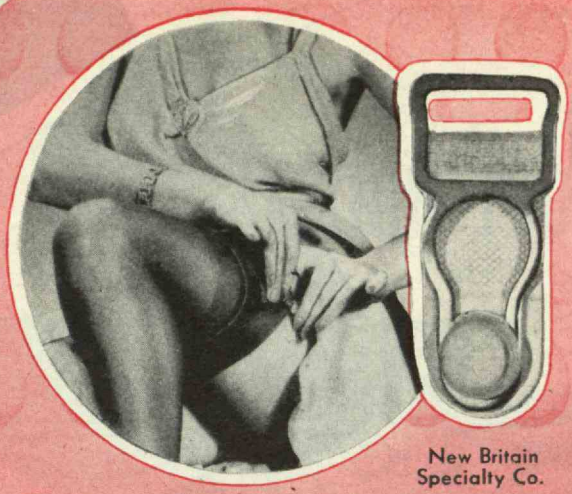
ESTABLISHED 1853



CAPTAIN HORACE L. HALL, U.S. Merchant Marine, retired, at his home in Springfield, L.I., N.Y., made daily recordings of transmissions from Australia, for more than four years, missing but four days. The apparently harmless news broadcasts kept the Australian Government in New York and Washington informed of every phase of the progress of the war, by a prearranged code.

The National HRO, used for this remarkable accomplishment is the first ever to have been shipped into the New York area and is over ten years old.

NATIONAL COMPANY INC., MALDEN, MASS.



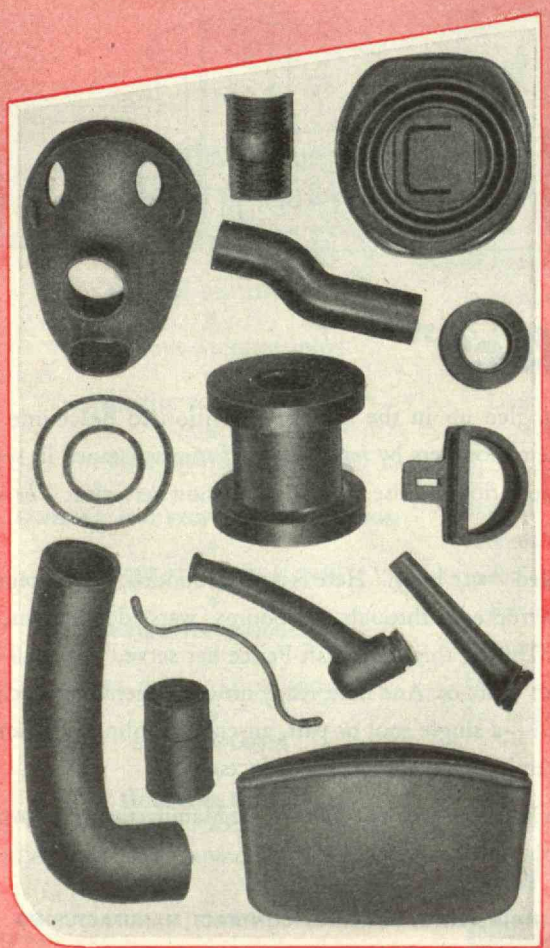
New Britain
Specialty Co.

From-
Rubber Garter Buttons

To-
Rubber Tobacco Pouches



Rogers
"Air-tite" Tobacco Pouch



From garter buttons to tobacco pouches . . . from goggle frames to faucet sprayers . . . from oil seal rings to dust boots—these are only a few of the innumerable precision-molded parts we are constantly producing in our extensive, modern plant for large and small manufacturers throughout the country.

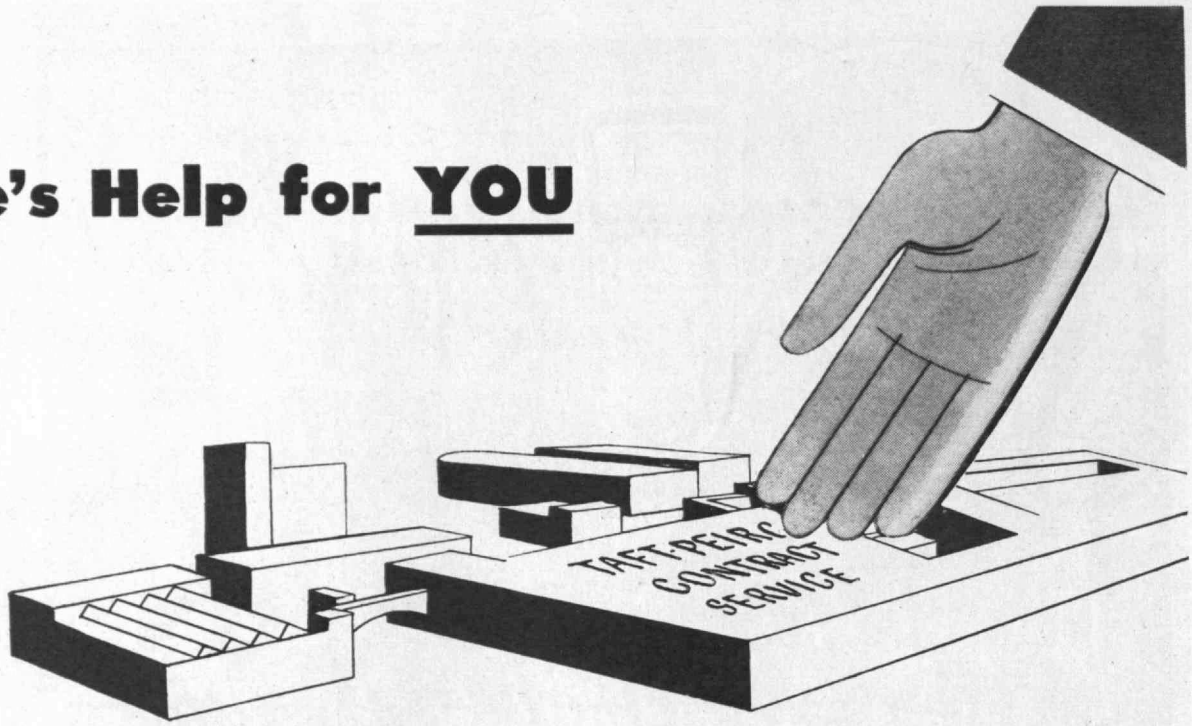
If it can be molded of RUBBER—ACUSHNET will mold it! Specialists since 1910 in processing, compounding and molding rubber, we are equipped to design and precision-mold, exact to specifications, parts or products of natural or synthetic rubber.

We welcome all inquiries. When writing, please include complete information, specifications or samples.

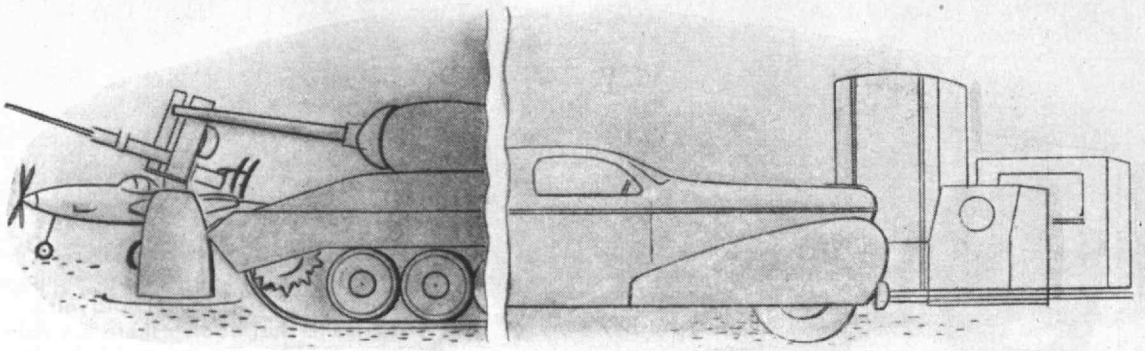
Background illustration:—a "heat" of rubber garter buttons produced in a multiple mold. Button and strip is cut for attachment to garter.

Acushnet PROCESS CO.
New Bedford, Mass., U.S.A.
Precision-Molded RUBBER *Parts & Products*

Here's Help for YOU



if you're struggling through



this "Quick-Change Act"

MANUFACTURERS, who are tangled up in the rush of transition to peacetime production, can get loads taken off their shoulders by *immediately effective* assistance in special work from this fast-moving organization, whose like is found nowhere else: *The Taft-Peirce Contract Division.*

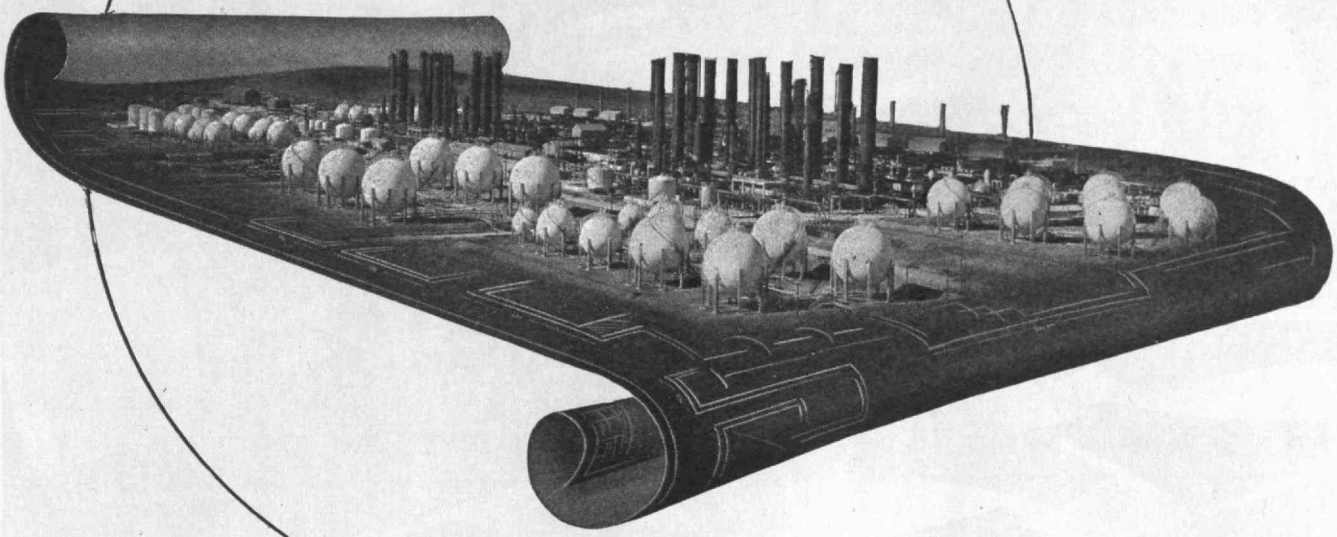
Here is no precocious, single-skilled "war baby." Here is a well-rounded, fully integrated plant which has grown up uninterruptedly through the booms, wars, depressions, and normal times of the last 75 years. During this time, Taft-Peirce has served plants all over the world, in every industry you can think of. And here, ready now, are men and machines to give you quickly what you need—a single tool or part, an entire tooling program, or repetitive production of parts, assemblies, or complete products.

For action *now,* without stalling, wire or write to The Taft-Peirce Manufacturing Company, Woonsocket, Rhode Island. Or phone Woonsocket 1.

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DESIGN PIONEERING



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Petroleum has become a cheap source material for the manufacture of many chemical products . . . such as styrene, butadiene, phenol, toluol, alcohols, acetic acid, ketones, esters, resins, plastics and solvents. And new large scale manufacturing techniques have added the further advantage of lower chemical production costs — costs that are immediately reflected in competitive consumer products. As a result, the petroleum chemistry field is on the threshold of still greater expansion. Excellent opportunities await progressive chemical manufacturers and refiners.

Lummus has pioneered in the development, construction and initial operation of chemical plants, petroleum refineries and petroleum chemical plants. Its engineering services are now available for the further development of projects for the production of chemical raw materials from petroleum sources . . . and the development of process units for the manufacture of specific chemicals.

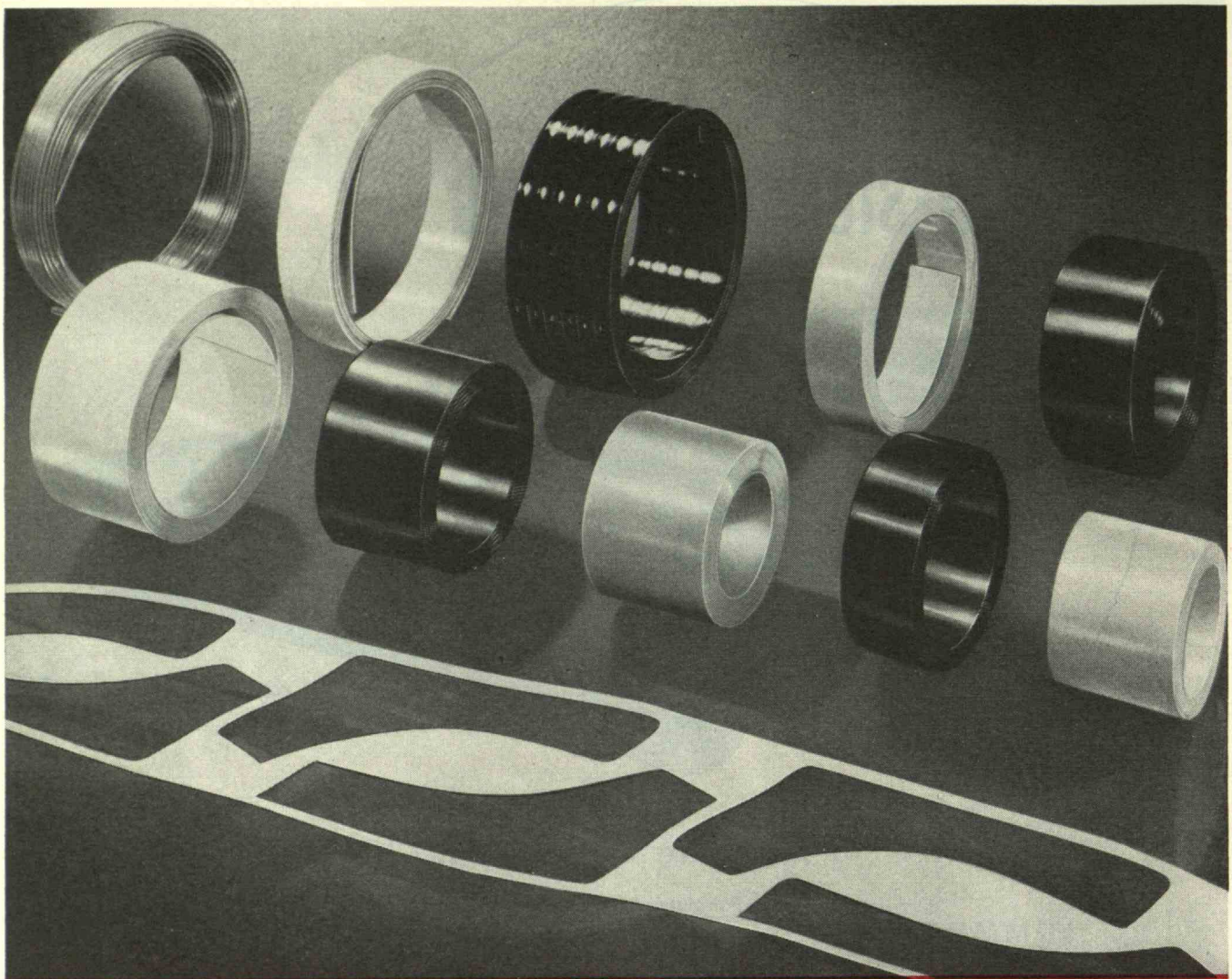
For further information write to: The Lummus Company, 420 Lexington Avenue, New York 17; 600 South Michigan Avenue, Chicago 5; Mellie Esperson Building, Houston 2, Texas; 634 South Spring Street, Los Angeles 14; In England: 78 Mount Street, London, W.1.

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LUMMUS

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The use of SANDEE Extruded Plastic Tape is growing rapidly among manufacturers everywhere for a great variety of punch press operations. It is being specified for jar and bottle liners, for tags, rings, fillers, spacers, washers, blanks, decorations, discs for toys and games, insulators, gaskets, and many other uses. SANDEE Tape is made in various thicknesses up to 3/16 inch and widths up to 10 inches. A wide range of colors, plain strip or ribbed contours, in rolls for continuous feeding or in cut lengths. SANDEE Tape is satisfactory for beading, forming, blowing, heating, drawing and general fabrication, on most existing equipment. Let SANDEE plastic engineers suggest the composition of materials best adapted to your needs. All orders manufactured to specifications only. No stock. Ask today for free samples and the cooperation of our capable technical staff. No obligation.

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EXTRUDED PLASTICS AND SPECIAL TOOLS

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DELIVER OUTPUT VOLTAGE CONSTANT TO ±½%

FLUCTUATION of line voltage need not impair the performance of your electrical equipment. Such variations are easily corrected with magnetic-type, entirely automatic Raytheon Voltage Stabilizers.

Positive control is gained. Power supply is stabilized to ±½%. Reliability and accuracy of performance are effectively improved, *and at low cost.*

Investigate. Determine how positive control of line voltage can benefit your equipment. Our Bulletin DL-47-537 gives the detailed story. Write for it today.

Get These Principal Operating Advantages:

- **Control of output voltage to within ±½% of 115 or 230 V.**
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- **Entirely automatic. No adjustments. No moving parts. No maintenance.**

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ELECTRICAL EQUIPMENT DIVISION

Excellence in Electronics



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One Year Older...
Many Years Wiser



War has taught us anew the desirability for accuracy and skillful craftsmanship—traits that have long characterized Diefendorf Gear products. In this year of 1946 Johnny Gear, a year older and many years wiser, stands ready to meet your gear requirements.

Our experienced engineers can help with your gearing problems.

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★★★★★ GEARS

THE TABULAR VIEW

Compression Distillation. — Taking time off from his numerous engineering and administrative duties at the United Shoe Machinery Corporation, PAUL COHEN, '35, comments (page 155) on the contributions which have recently been made by another Institute Alumnus, Commodore Robert V. Kleinschmidt, '18, in developing satisfactory methods for converting abundant supplies of sea water into fresh drinking water. Mr. Cohen is a frequent contributor to The Review and since 1938 an editorial associate.

Industrial Eyesight. — How a few modern pioneers in eyesight tests developed a numerical method of rating visual characteristics of human eyes and how these tests enabled industry to adapt employees' work to their visual skills is ably recounted (page 159) by DAVID O. WOODBURY, '21, who takes delight in showing the futility of employing Nineteenth Century eye tests for Twentieth Century industry. Mr. Woodbury is author of several books and is a regular writer on science and engineering for *Collier's*.

Group Dynamics. — KURT LEWIN, Director of the Institute's Research Center for Group Dynamics, lends his authority and considerable experience to a discussion (page 163) of a better understanding of the behavior and psychological reactions of members of minority groups. Dealing with a social problem of major significance, Dr. Lewin's article is the result of careful and painstaking work in the social sciences conducted at Stanford, Cornell, Iowa, California, and Harvard universities as well as at the Institute. These researches have enabled Dr. Lewin to lay the foundation for a systematic theory of group dynamics.

Salvage. — For centuries the sea has claimed many sunken-ship treasures which have not been recoverable because of limitations in engineering materials and techniques of submarine salvage. WILLY LEY discusses (page 165) the possibility of retrieving some of the vast sunken treasure through recent developments in engineering. A prolific writer on engineering and science subjects, Mr. Ley is the author of several books, of which *Rockets* and *Shells and Shooting* reflect an intense interest in air-borne missiles. He has done research work since last summer for the Washington Institute of Technology in the nation's capital.

Early Brain Trust. — Thoroughgoing student of science and history, I. BERNARD COHEN, who teaches physics at Harvard, combines these two interests to record (page 167) the high degree to which science was marshalled during the Civil War in forming a scientific brain trust. His recent articles include "Newton and the Modern World" and "Benjamin Franklin as Scientist and Citizen" in the *American Scholar*, "Benjamin Franklin and the Mysterious 'Dr. Spence,'" in the *Journal of the Franklin Institute*, and "Science and the Revolution" in The Review for April, 1945.



CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

ARMY E NAVY

MOLYBDIC OXIDE, BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company

MOLY

500 Fifth Avenue · New York City



Before TOKYO Saw Them . . .
STARRETT TOOLS Looked LOCKHEED'S LIGHTNINGS Over

The "ON-TO-TOKYO" Model P-38L Lightning with its 425-mile an hour speed and 4000-pound bomb capacity called for countless precision measuring and inspection operations, many of which were performed with Starrett Micrometers, Vernier Gages, Dial Indicators and other Precision Measuring Tools.

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Now, with 4 Service Stars

THE L. S. STARRETT CO., ATHOL, MASS., U. S. A.
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PRECISION TOOLS • DIAL INDICATORS • GROUND FLAT STOCK
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Here are valuable facts on actual applications of DRY ICE and CO_2 for every potential user of these vital materials—summarized from a recent Liquid survey. All applications listed are in practical use... Many of the wartime functions of DRY ICE and CO_2 have peacetime counterparts—*perhaps in your industry.*

Use this chart as a check-list for possible applications to your processes or problems... DRY ICE and CO_2 serve industry in many important ways including chilling lubricants, shrinking metals, packaging foods, processing oil, controlling paint quality, etc.

Ask for your copy of this free chart today . . . You'll find it helpful in many ways.

The Liquid Carbonic Corporation
3110 South Kedzie Avenue, Chicago 23, Illinois
Branches in Principal Cities of the United States and Canada

MAIL RETURNS

Plaudit

From F. G. Fassett, Jr.:

Congratulations on the distinguished issue which launched Volume 48, from the double *M*'s of the "Tabular View" to the smooth layout of the carry-over. Brother, I know what a task that is. The Review for November sets a new high mark. More power to all of you.
Washington, D. C.

For Nonspecialization

From F. La Verne Smith, '23:

In "Mail Returns" in the July issue Mr. McKaig recommends that you publish more technical articles. Please don't; we can get them in our usual technical magazines. Scientists are of necessity becoming more and more specialized in their particular work, and many, I am sure, need reading material to broaden their vision. I suggest more articles similar to Reverend Kopf's address (published in the July issue) on work, love, and worship. Let's not stress the work alone, the others are even more valuable.
Hynes, Calif.

Problem for the Analyzer

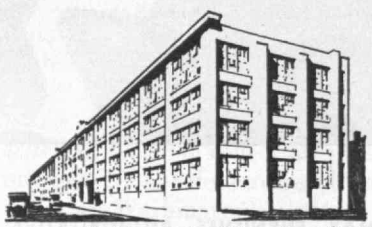
From Andrew Langdon, '22:

Reading Professor Caldwell's article on the new differential analyzer at the Institute calls to mind that old problem of the two cyclists and the fly — a problem which his machine could undoubtedly solve with the greatest of ease.

You will recollect that two cyclists, *A* and *B*, started simultaneously from towns, *X* and *Y*, 10 miles apart and pedaled toward each other on a straight road at a uniform speed of 10 miles an hour. At the instant of starting, a fly landed on *A*'s forehead, and *A* promptly brushed it off; the fly flew to *B*'s forehead by the shortest course, and *B* brushed it off; and then the fly returned to *A*'s forehead, and so forth. This procedure continued until the fly was crushed between the foreheads of *A* and *B* when they collided some minutes later. Assuming then that no time was consumed in brushing the fly and that the fly flew at an average speed of 20 miles an hour, how far did the fly fly?

I well recollect giving this problem to one of the mathematical wizards (better unnamed) in Course VI one afternoon and having him tell me the next morning that he hadn't had much time to work on it but that the answer was approximately 9.99 miles.
Rochester, N. Y.

Speed with Economy



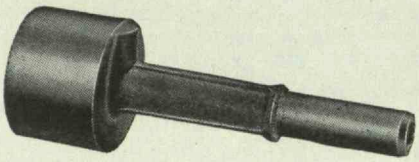
Mack International Motor Truck Corp.

Getting your new factory into operation quickly may mean thousands of dollars to you — in production, sales and customer good-will. Our slogan "Speed with Economy" means what it says.

W. J. BARNEY CORPORATION
101 PARK AVENUE, NEW YORK
INDUSTRIAL CONSTRUCTION
Alfred T. Glassett, '20, Vice President

LEADERSHIP

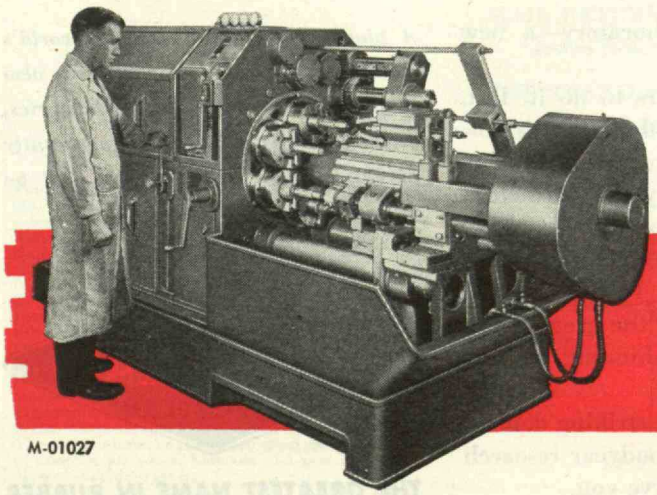
PROVED BY HUNDREDS OF CASE HISTORIES



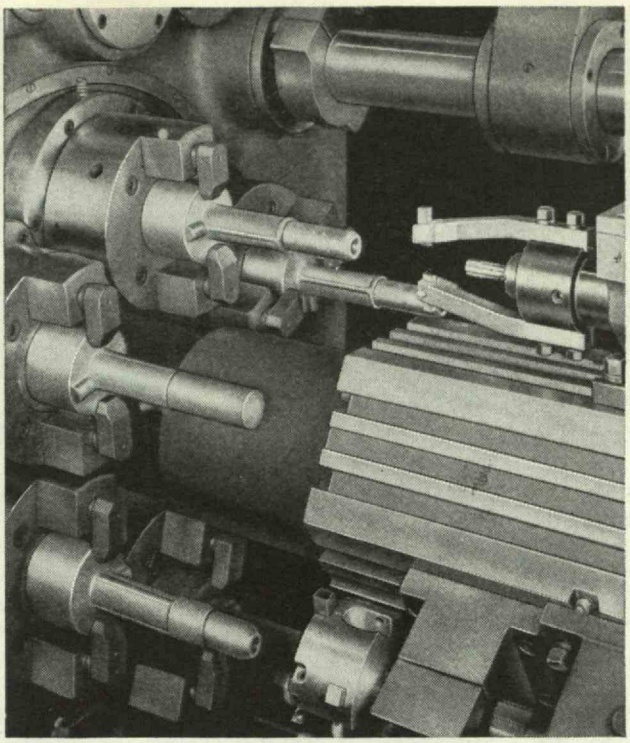
Cast Iron Distributor Base, now machined on New Britains by one of America's leading automotive manufacturers.

In order to speed production the manufacturer sought a method of doing this job on a multiple spindle chucking machine. The difficulty presented was the necessity for maintaining the required concentricity of the hole (±.005) between the bowl and shank ends. Because of the thin wall at the bowl end and the long 9-3/16" shank the drilling operation was made extremely difficult by the weave in the shank as it was turned. New Britain engineers developed the answer, with the use of special hydraulically operated hook bolt fixtures and drill guide on a New Britain Model 675 chucking machine.

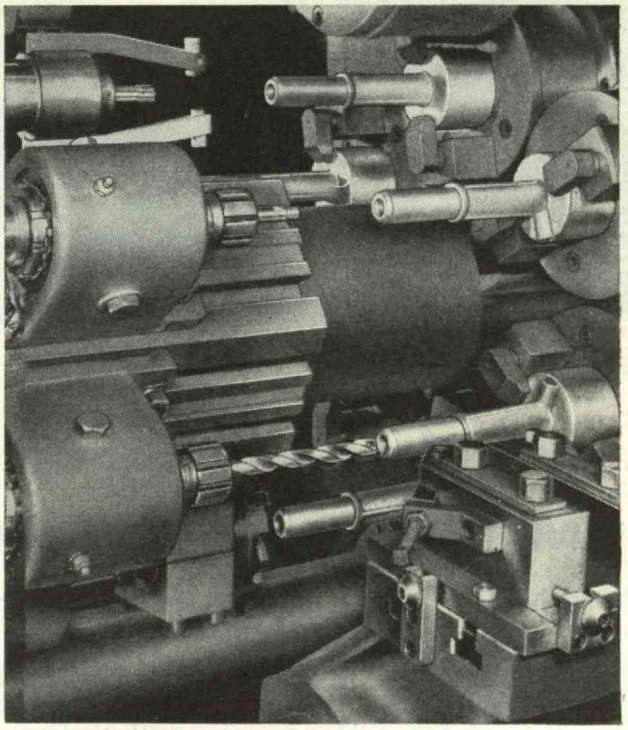
Production was stepped up six times over that of the lathes formerly used. The operation is performed in 19.4 seconds, or 186 pieces per hour, and with concentricity well within the manufacturer's requirements. Here is another typical example of how the versatility of New Britain Automatics and New Britain engineering has applied the economy of multiple spindle automatic production to a job which formerly limited the manufacturer to slower, more costly methods.



M-01027



ENTIRELY OPEN END CONSTRUCTION... LOADING POSITION EASILY ACCESSIBLE



REAR VIEW: NOTE ACCESSIBILITY OF ALL TOOLS

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN, CONNECTICUT
NEW BRITAIN-GRIDLEY MACHINE DIVISION



He takes sap from a tree without the tree!

ANOTHER REASON FOR GOODYEAR LEADERSHIP

Not long ago, Goodyear experts made history by producing an entirely new kind of cushioning material—Airfoam. They took liquid latex—the sap of the rubber tree—and "beat it" until it frothed up into air-filled foam.

When war stopped the flow of this sap, Goodyear attempted to make Airfoam from the man-made latex used in the production of synthetic tires. It was no go. Instead of remaining frothed, the synthetic latex flattened out. So Goodyear chemists started out to create—in the laboratory—a new "sap."

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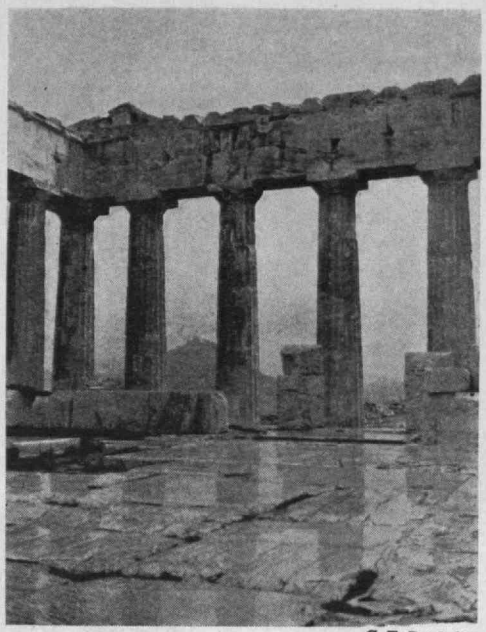
VOLUME 48 NUMBER 3

THE TECHNOLOGY REVIEW

TITLE REGISTERED U. S. PATENT OFFICE

EDITED

AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY



C. E. Patch, '02

The Parthenon

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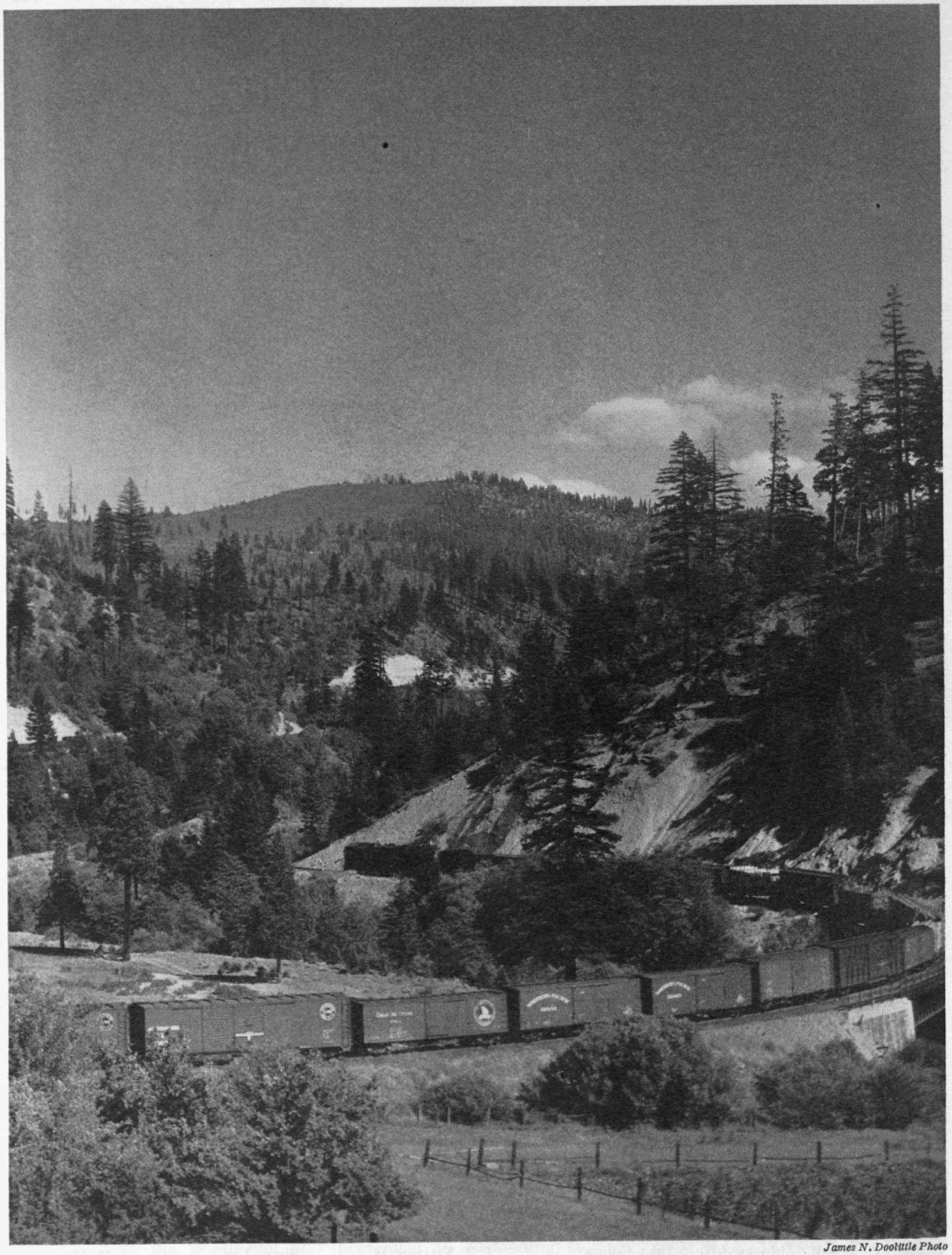
Published monthly from November to July inclusive on the twenty-seventh of the month preceding the date of issue, at 50 cents a copy. Annual subscription, $3.50; Canadian and foreign subscription, $4.00. Published for the Alumni Association of the M.I.T.: A. Warren Norton, President; Alfred T. Glassett, Alf K. Berle, Vice-presidents; Charles E Locke, Secretary; Ralph T. Jope, Treasurer. Published at the Rumford Press, 10 Ferry Street, Concord, N. H. Editorial Office, Room 7–203, Massachusetts Institute of Technology, Cambridge 39, Mass. Entered as second-class mail matter at the post office at Concord, N. H. Copyright, 1946, by the Alumni Association of the Massachusetts Institute of Technology. Three weeks must be allowed to effect changes of address, for which both old and new addresses should be given.

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THE
TECHNOLOGY
REVIEW

Vol. 48, No. 3

January, 1946

The Trend of Affairs

Hibernation Under Vacuum

THOUSANDS of varieties of micro-organisms work for industry (see The Review for January, 1945, page 171). One strain of yeast, for example, may act with special efficiency on waste sulphite liquor to produce alcohol, another on corn to produce acetone and butanol, a third to produce glycerol, and so on. Or a particular variety of mold may show special aptitude in synthesizing citric acid. Once such a thoroughbred strain has been isolated, it becomes a valuable property which must be protected not only from disease and contamination but also from uncontrollable mutations which might change its characteristics. The care and feeding of these aristocratic little organisms by the usual techniques of plating them on sterilized agar, keeping them in sterile environments, and testing them now and then for potency is a procedure which requires considerable time of highly skilled personnel.

By applying basically the same process used to dehydrate orange juice and other agricultural products with delicate, hard-to-keep flavors, this procedure has been greatly simplified. In this new method, called the lyophil process, a small amount of the micro-organism in its spore state is placed in a tiny glass tube, so small that 1,200 tubes can be stored in a tray 14.5 inches long, 12.5 inches wide, and 2.5 inches deep. The tube is placed in quick-freezing solution, and the frozen tissue is then dried under vacuum, a process which causes remarkably little disturbance to its physical or chemical condition. While still under vacuum, the tube is sealed and stored at near zero temperature. A few strains of molds do not react well to this technique, and a few more require recultivation every two years, but the majority can apparently remain in this dried and frozen state indefinitely. To reactivate one of these micro-organisms, the dried pellet is removed from its tube, wetted with water or a nutrient solution, and smeared on an agar plate where it proceeds to grow in normal fashion.

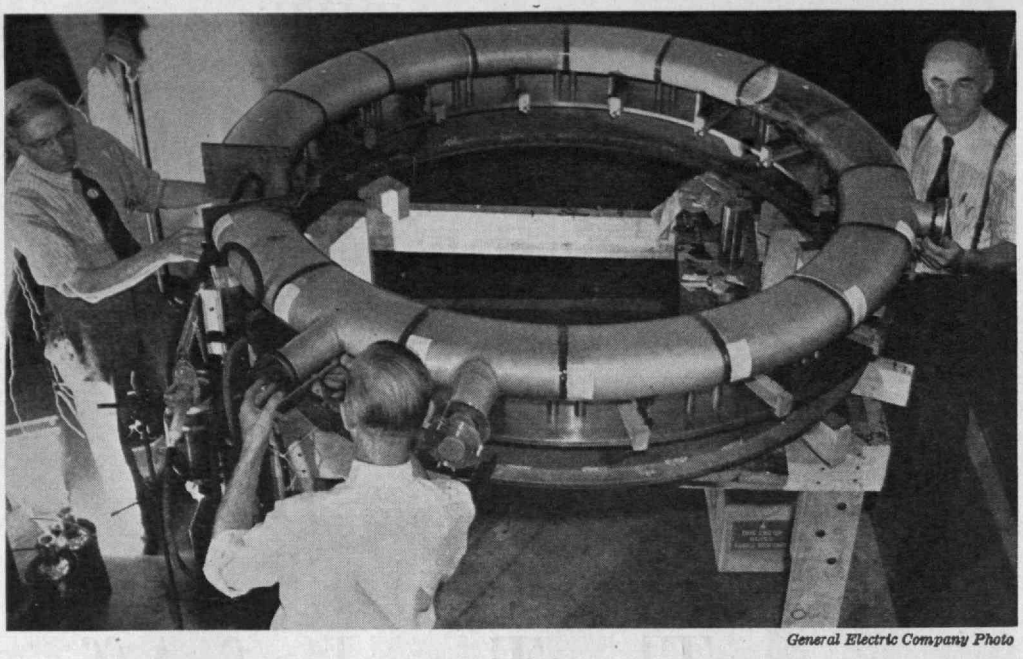
This technique was developed at the Northern Regional Research Laboratory at Peoria, Ill., where, in the course of almost four years, the reactions to this process of nearly 4,000 strains of molds, yeasts, and bacteria have been tested. The use of vacuum to reduce the temperature at which water may be removed from heat-sensitive materials, called sublimation when the ice in the frozen substance changes directly into vapor without passing through the liquid phase, is being put to increasing industrial use. Penicillin and blood plasma are being dried in this manner on a large scale.

Nine Degrees

By Paul Cohen

SUPPLYING troops with water is a cardinal problem of logistics in any war, but World War II, fought frequently on sea, on lands that were waterless, and in areas that possessed such polluted supplies that they might, for all practical purposes, have been waterless, made this problem one of terrifying size and complexity. Of the many ingenious expedients developed to provide for the lone survivor of plane crash or shipwreck much has been said. There was also the task of providing for masses numbered by divisions on such places as Iwo Jima, Saipan, and the Coral Sea atolls and, of course, of supplying ships' crews during the many months away from supply ports. Although military requirements are not directly comparable with civilian uses, it is interesting to note that the French transatlantic liner, the *Normandie*, whose periods at sea were normally less than a week, had tanks capable of holding some 1,000,000 gallons of water.

The evaporators which are normally used to distill large amounts of portable water when other sources are unavailable are heavy consumers of fuel. Since the fuel has generally been made accessible by the exclusion of badly needed supplies or armament, from the military point of view this is a fault even harder to excuse than in an industrial application. It can now be revealed that during



General Electric Company Photo

BETATRON — Removal of wartime restrictions has enabled the General Electric Company to reveal details concerning its 100,000,000-volt betatron or electron accelerator. The betatron develops x-rays more penetrating than those produced from the recently completed 2,000,000-volt x-ray tube. In addition, other interesting forms of radiation, previously available only in cosmic rays, have also been produced.

The principal part of the betatron is a 130-ton electromagnet of laminated silicon steel, 9 feet high, 6 feet wide, and 15 feet long. Passing through the magnet from front to back in a rectangular opening are the ferromagnetic pole faces, 76 inches in diameter, which are wound with coils of 1-inch copper tubing. Power to the electromagnets is provided from a bank of capacitors rated at 24,000 volts, 1,000 amperes. Discharge of the condensers through the copper coils energizes the magnet, and an intense magnetic field is concentrated between the horizontal pole faces.

The heart of the betatron, shown under assembly here, is a toroidal vacuum tube made of 16 sections of molded and tempered pyrex glass, cemented together and placed between the pole faces in the operation of the betatron. The tube is 74 inches in over-all diameter and has an elliptical cross section 8 inches wide and 5 inches high. The interior of the toroid was made conductive by sandblasting the inner surface, which was then silvered. At one point of the toroid is an electron gun to provide a source of electrons. The electrons are given an initial acceleration by an electrode maintained several thousand volts more positive than the electron-emitting surface. Once started on their way, the electrons are made to travel in a circular orbit by the intense magnetic field.

The electrons are accelerated in their circular orbit for as much as a quarter of a cycle (1/240 of a second) when a pulse of current through two auxiliary coils on the pole faces causes the electrons to leave their circular orbit and strike a tungsten target which they had previously missed. Striking the target, the electrons generate x-rays which emerge from the toroid in a narrow circular beam. Although the betatron may also be operated at reduced power, when operated at full power the electrons make 250,000 revolutions and produce 100,000,000-volt x-rays.

much of the war the armed forces were using evaporators based on the compression-distillation principle that required about one-third or less of the fuel needed by the most efficient multiple-effect evaporators and were approximately 15 times more efficient than the usual single-effect evaporator. The latest models of these compression stills will average at least 175 pounds of distillate for each pound of fuel used, a ratio believed to be higher than for any self-contained system of evaporation except, of course, the solar still.

Although the principle of compression distillation dates from 1856, no American industrial applications before World War II are known. However, the possibilities of this method for meeting military demands for water were seen well before Pearl Harbor by Dr. R. V. Kleinschmidt, '18 (now Commodore Kleinschmidt of the United States Naval Reserve), and a development was initiated in the laboratories of Arthur D. Little, Inc. At the time the United States entered the war, specialized units were already under construction for the armed services. Built by the thousand for submarines, destroyer escorts, and landing craft as well as for land applications, there was enough compression-distillation equipment in service at the war's end to supply the needs of over 1,000,000 men. This figure is based on a daily per capita consumption of seven gallons. Additional stills have since been put in service. The process is covered in detail by a paper presented on November 27 before the American Society of Mechanical Engineers by Allen Latham, Jr., '30.

Compared to the conventional evaporator, a compression still has two remarkable features: It lacks a condenser, and it possesses a steam compressor (generally driven by a gasoline engine in the portable, comparatively small-capacity units required by the military). In a compression still the steam rising from the raw water or brine goes to a compressor. It leaves the compressor at a higher temperature and pressure (by about three pounds a square inch) than it entered. Thus, instead of condensing or boiling at 212 degrees F., as it would at atmospheric pressure, the steam can now condense at about 222 degrees F. Since the raw water or brine from which the steam is being evaporated is about 213 degrees F., a temperature difference of approximately 9 degrees is created.

The boiling raw water is now cold by comparison with the steam leaving the compressor, and so the thrifty engineers simply pipe the steam back into the evaporator. As the steam condenses, it releases its latent heat which boils off more steam, and so the process continues. Naturally, the higher-pressure steam which is condensing must be kept separate from the steam evaporating from the raw water, heat transfer taking place through metal surfaces.

The compression still is somewhat more sensitive to scale formation on these surfaces than is the orthodox evaporator, for the temperature gradient must be increased to maintain the same rate of evaporation, and this can be done only by increasing the pressure of the steam leaving the compressor. Since the compressor on the military designs is generally driven by an internal combustion engine, the exhaust gases from which also heat the evaporator, and since these gases have more than enough heat to bring about a balance in the system, even when the heat-transfer surfaces are clean and the load on the compressor is

least, the increased heat output of the engine under heavier load is simply wasted. In a more or less typical field test the compressed steam pressure rose from 3.1 pounds a square inch gauge at the beginning to 5.3 pounds a square inch after 730 hours of operation. The initial output of 185 pounds of distilled water for each pound of fuel had dropped to 122 pounds at the end of the test.

Where the condensate must be pure and free from oil contamination, as is the case with water, the choice of compressors is quite restricted. The presence of lubricant in the compression space is ruled out, and seals must be used to prevent shaft lubricants from entering. While centrifugal- and axial-flow compressors might meet these requirements, their characteristics conflict with the need for a gradually rising pressure as scale builds up on the heat-transfer surfaces. Blowers of the Connersville type are generally used.

Because of the simple operation of this process and because of its unusual efficiency, which is expected to exceed the quoted figures as units grow larger and heat losses become a smaller part of the total heat balance, many industrial applications are anticipated.

Identification Tags —Early Models

THE manufacture of badges, buttons, cards, and other means of identification, intended to make ingress and egress to restricted areas comparatively easy, has assumed the proportions of a sizeable business during the past four years. No establishment producing goods for military purposes was without its ample quota of identification tags for regular employees, semiofficial liaison personnel, and accredited visitors, and many firms only remotely associated with the manufacture of war products likewise succumbed to elaborate means of personnel identification.

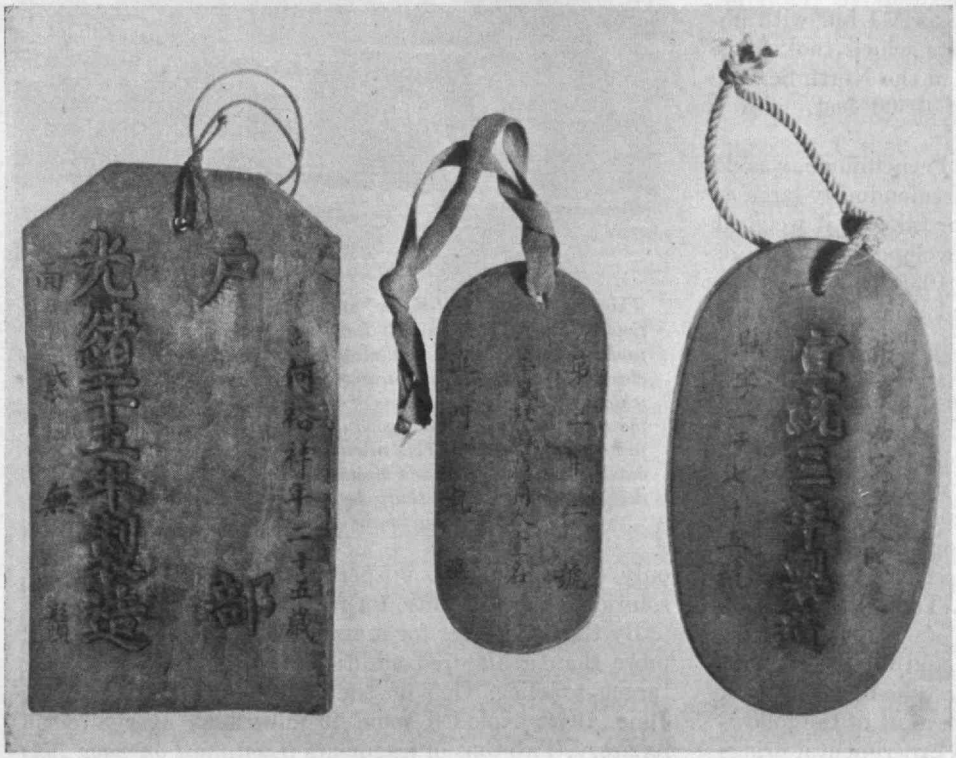
It is to be expected that the end of the war may greatly diminish the number of these annoying devices, concocted, so it would seem, to tear one's clothing and to hide at the crucial moment of entering forbidden zones. Certainly many who displayed identification badges (not infrequently referred to as "dog tags") as a necessary evil will be glad to be rid of the plastic-covered passports likenesses which, more often than not, bear little resemblance to the individual to be identified and which sometimes are even misinforming.

Although identification badges took on a variety of forms not previously used, and although employed to a greater extent than heretofore, these personal adornments are by no means an innovation. Indeed, centuries ago the Chinese had worked out techniques for hindering the entrance of unauthorized persons to palaces or other lofty governmental quarters. The tags shown on this page date from the Nineteenth Century, and, although not among the earliest examples of their kind, they nevertheless greatly outdate modern identification badges.

The tags illustrated are made of close-grained wood, about three-eighths of an inch thick, and have highly polished surfaces. Usually intended to be worn on a cord or thong about the neck or waist, they were issued, for purposes of identification and authorized entrance, to merchants, gardeners, calligraphers, and others whose occupations brought them to the imperial palace.

One side of the wooden badges usually bore the description of the person being identified and often indicated the purpose for which the tag was issued. Markings of an individual nature were inscribed in ink in fine Chinese characters. The reverse side of the badge customarily bore the seal of the imperial palace or governmental office issuing the tag. Such markings, common to many identification tags, were usually burned into the wood by a metal branding iron or its equivalent.

The three tags shown here are from the Dard Hunter Paper Museum and are reproduced approximately one-half of their actual size. Translations were made by Yun Tsung Chao, '38, and Dr. Hunter.



Wooden identification tags, used to approve entry of properly authorized individuals to Chinese palace grounds, date back over many centuries, although those shown here are comparatively recent. The rectangular badge at the left identifies the calligrapher Ho Yi-chiang, described as 25 years old, purple of face, and without facial beards. As indicated by brandings on the reverse side, this badge was issued by the office of the imperial palace superintendent in the 25th year of Kwangsu (about the end of the Nineteenth Century) and was worn about the waist. The badge in the center provides door entrance for one merchant from the Hua Hsing Bank Company. The seal of the issuing office is burned in on the reverse side, and the badge was issued in the year of Kwei-hei. The oval tag at the right identifies the calligrapher Hsi-ching of Room Chingssu, No. Chao 1075. The badge was made in the third year of the Cheun Tung reign. The reverse side shows the seal of the imperial palace and the information that it was issued — as was the tag at the extreme left — by the office of the imperial palace superintendent.

Rocket Weapons

INVESTIGATIONS by British Intelligence and Royal Air Force experts, recently published by the Royal Aero Club, have shed some light on the details and history of the German long-range rocket V-2, which constituted the most important contribution of the nazi war machine to scientific progress.

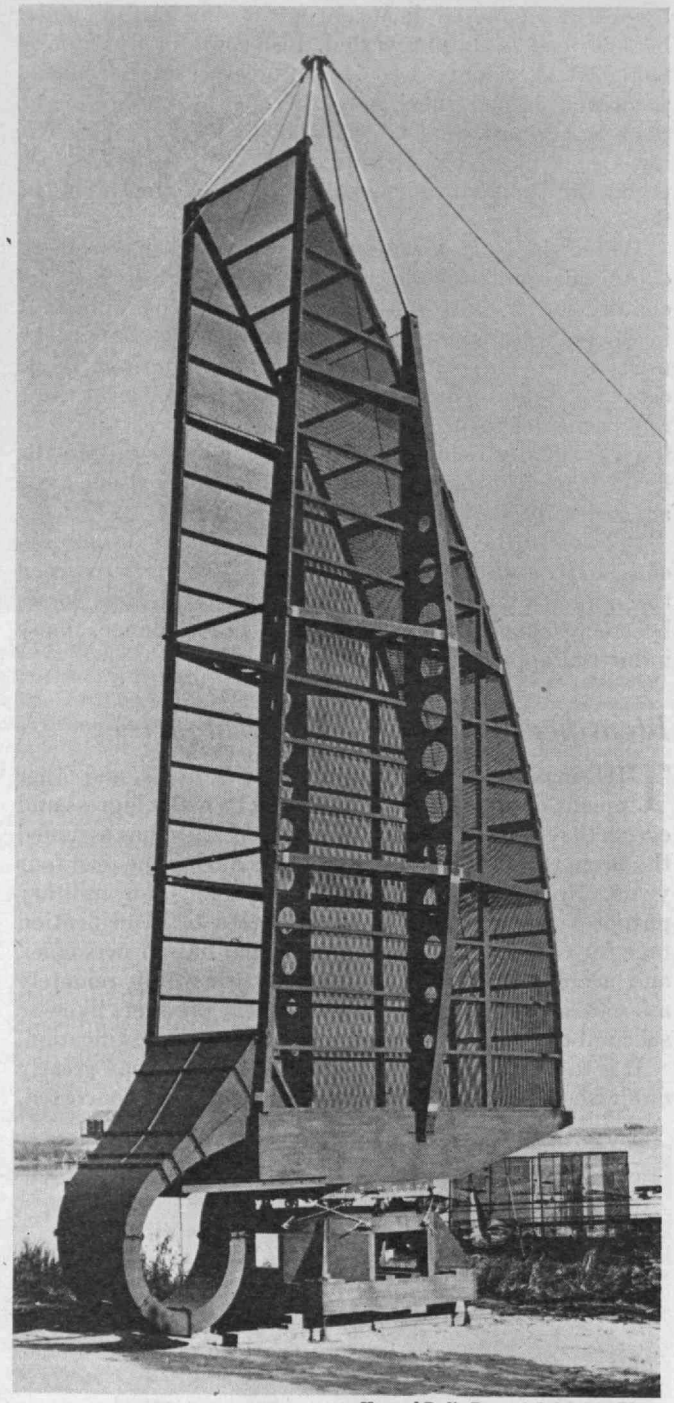
Most of the research and experimental work took place on the German island of Usedom, which is the westernmost of the two large islands separating the Bay of Stettin from the Baltic Sea. The experimental station was located in the immediate vicinity of the small fishing village of Peenemünde, which is located at the extreme northwest point of that island, and it was, for this reason, referred to as the "Peenemünde Institute." Founded in 1937, it became active in 1938, and experiments were carried on there until the institute was almost obliterated by the bomber command of the Royal Air Force during the night of August 17, 1943. One of the weapons developed at that institute was the German flying bomb V-1, and a subsection developed the army projectile rockets of the types *Nebelwerfer* and *Schweres Wurfgerät* (described in the February, 1945, issue of The Review).

However, the main activity of the institute was directed toward the development of large-size liquid-fuel rockets. This main section was under the command of General Dornberger, with Professor Wernher Freiherr von Braun in charge of construction and Professor Hermann Oberth doing the theoretical work. General Dornberger's rocket-projectile research group had existed as a part of the German army's weapon research before the Peenemünde Institute was founded.

In 1933 Dornberger and Count von Braun had developed a 330-pound liquid-fuel rocket, called A-1 (Aggregate No. 1), which was tested at the artillery proving ground at Kummersdorf, not far from Berlin. It had been about 4 feet 7 inches long and had had a largest diameter of one foot. The next design, A-2, was finished and tested in 1934; it was about the same size as A-1 but with important design changes. In the tests which took place from the German island of Borkum in the North Sea the A-2 rocket reached an altitude of 6,500 feet, with a burning time of 16 seconds.

A-3, the first rocket developed at Peenemünde, was 25 feet long and 2.5 feet in diameter, tremendously large as compared to A-1 and A-2. Ready for take-off it weighed 1,650 pounds; its rocket motor developed a thrust of 3,300 pounds for 45 seconds. In 1938 it reached an altitude of 40,000 feet vertically and a maximum range of about 11 miles horizontally.

The next model was *Fernrakete* A-4 (long-distance rocket A-4), which later became known under the designation V-2. At first it looked as if the new model were going to be disappointing. The first A-4 rocket, fired on July 6, 1942, rose just three feet and then exploded, destroying the testing site. The second and third to be fired exploded at an altitude of about 16,000 feet. The fourth, fired in October, 1942, successfully covered a range of 170 miles, as did the fifth. Then a series of 13 disappointments followed — some of the rockets exploded, some just did not function, and many broke up in the air only a few seconds after take-off. However, the nineteenth was a success, as were most of the following. Among the subsequent hundred experimental firings only one out of five misperformed, in most cases dissolution being the cause for failure.



Harvard Radio Research Laboratory Photo

This odd-looking "half-cheese" antenna was designed by the scientists of the Radio Research Laboratory at Harvard University under the direction of Frederick E. Terman, '24, as a reflector element of radar-jamming transmitters. By creating interference which made the radar systems of German night fighters ineffective, the Royal Air Force made good use of radio-jamming methods to protect their bombers. This microwave half-cheese reflector is excited by the waveguide and electromagnetic horn at its base. It is designed to produce a sharp beam in the vertical plane and a relatively broad beam in the horizontal plane.

By then the order for mass production was given, and more than a hundred additional rockets were used for target practice. One of the practice rockets, fired in June, 1944, exploded some 40 miles high over Swedish territory. Two tons of fragments (*Continued on page 194*)

Better Eyes for Industry

Numerically Rating Visual Characteristics, Improved Eye Tests Enable Industry to Apply Properly the Wide Range of Visual Skills of Its Many Employees

By David O. Woodbury

IF you are like most people you give your eyes about as much care and understanding as you do your feet. Because you see well enough in daily life you ignore eyesight altogether, supposing it is perfect. That mistake has already meant tragedy for millions in lost jobs, inefficiency, accidents, ill health, and decreased earnings. When the world learns that eyes are precision instruments with many potential skills, vast benefits will come to everyone.

No pair of eyes is perfect, any more than any camera is perfect. Hundreds of different cameras are designed for different jobs. Optical science has discovered as many different eyesights, each one best for a special type of job. A century ago most work was done outdoors, and "normal" eyesight meant good vision at a distance. Today the working world is under our noses; normal eyes do not exist. Some work requires clear vision eight inches from your face; other jobs demand extreme depth perception, color sensitivity, lightning rapidity in far-to-near accommodation. One eye alone can see to do some work faster and more comfortably than two eyes. There are operations that the blind can do better than the seeing. But by conventional standards all such people are hopelessly incapacitated.

War has forced us to overhaul obsolete ideas of vision. Now it is not what your eyesight is but what it can do that counts. A whole new science of industrial vision is in the making. The discovery and application of visual skills may bring about a new industrial revolution.

Few factories and fewer employees realize that eyesight can be advantageously matched to jobs. Old-time normal vision, good at 20 feet, is still a measure of your fitness for any job. Whether you are a toolmaker or a clerk you must pass the same test as a truck driver or a janitor. If you fail, you get work where poor vision is considered no hindrance. Hidden visual skills are mostly ignored — and wasted.

Enlightened industry has been examining employees' eyes for 30 years. By 1941 all big plants considered eye tests one of the most important parts of medical examinations for job applicants. Those with substandard vision were turned away. A huge class of industrially blind had grown up. It included thousands of skilled artisans, adrift in the market with little prospect of a good job. These people were out of luck simply because employers, honestly trying to set up high standards of physical fitness, had been told to use obsolete visual tests inherited from Civil War days.

Vast numbers who did pass the tests brought the wrong visual skills to their work, squinting and straining to see the task they were trying to do. Thousands of accidents followed; fantastic records of poor workmanship, inferior production, and low morale resulted. All were blamed on stupidity, clumsiness, and on anything other than improperly applied vision — usually the real cause. Even more people in industry, who had become experts at their jobs, began to get "too old" for their work and were demoted or dismissed. No one seemed to remember that close vision always deteriorates around age 40 but usually can be completely restored with glasses. In extreme cases, persons went to eye specialists for reading glasses but never considered wearing them to work. As a result, old timers everywhere slid off into unimportant jobs as they approached 60, and thus some of the most experienced and valuable artisans were taken out of circulation.

When the war emergency forced industrial America to scrape the man-power barrel clean, everyone who could stand erect got a job and kept it, eyes or no. In a few plants, intelligent personnel directors began to investigate the possibility of a relationship between visual skills and jobs. It was not a new idea; it was new only to industry, which had always had a labor surplus. But now every man must count to the utmost if giant output schedules were to be met. These enlightened directors found that psychologists and optical experts had long been trying to arouse industry to the value of matching eyes to jobs. An industrial vision program was ready to go, waiting only for the chance to be tried. Here and there the idea was adopted; today it has become an outstanding success among a few hundred thousand people. Its expansion throughout the country depends on industry's becoming aware.

The eyes-for-the-job idea started 12 years ago in a hunch of A. E. Betts, a Cleveland school superintendent. Betts thought children's eyes should be tested before they learned to read. But doctors had no standards of visual skills or any method of identifying them. So Betts began to experiment on his own with the help of R. A. Sherman, then of the Keystone View Company in Meadville, Pa. Sherman developed a new instrument, a modern version of the old stereoscope, using design cards instead of pairs of pictures. He scoured the optical professions for intelligent help and found it in Dr. Carl F. Shepard, a Chicago optometrist. Together they tried out more than 40 tests. A mass of data was collected from experiments on thousands of children, but it gave little light on whether a child could or could not read.

A psychologist, Joseph Tiffin, tried the instrument on college freshmen with even less success. Vision and scholarship seemed utterly independent of each other. But all these investigators believed in the existence of visual skills and kept on. Betts's work in the schools eventually yielded the reading clinic; Tiffin opened a department of industrial psychology at Purdue University with visual



Courtesy of Bausch and Lomb Optical Company

The Ortho-Rator, shown here in use at the plant of the Sperry Gyroscope Company, has played an important role in correlating employees' visual skills and industrial operations.

studies as a main issue; and Sherman moved to the Bausch and Lomb Optical Company, which had agreed to underwrite this research project.

Associating with Dr. Hedwig Kuhn, an industrial eye specialist who had done splendid work in the Indiana steel mills, they tested 16,000 employees, searching for some connection between eyesight and job efficiency. They found almost nothing. In the midst of discouragement it dawned on them that visual skills, like the eyes themselves, were so delicately balanced that rough-and-ready, pass-or-fail tests could not possibly spot them. A numerical scoring system was needed, backed by a high-precision instrument to grade every pair of eyes in successive steps from zero to near perfect. No such instrument existed. After two years' work, Bausch and Lomb developed a device called the Ortho-Rator, with which a trained operator could score most of the important talents of a worker's eyes and record them all on a punch card to make up a definite and individual pattern.

With an early form of Ortho-Rator, Tiffin got the first hopeful results. Cards taken on large groups of machine operators showed similar patterns when the operators were better than average, but scattered, dissimilar patterns when they were poor workmen. Tiffin knew what must be done next — a vast statistical study should be made on workers of every kind, millions of pattern cards sorted, and visual skills gradually lined up with particular types of manual and brain work. It would take years and a large sum of money. Just as he made his start, the United States went to war, and supplies of men and materials for such a program dried up completely.

Then war itself came to the rescue of industrial vision. Soon after the attack on Pearl Harbor, the Navy began sending groups of recruits to special training centers for range-finder operators. The first unit was especially picked as the best material that standard tests could turn up. Practically every man failed, and the whole group was rejected. Range finding requires extreme depth perception or stereopsis, and standard eye examinations ignore it. The Navy immediately looked around for better tests which would feed the right material into the specialty schools without time-consuming errors. The half-developed Ortho-Rator was adopted, and priorities for its development and manufacture were allowed. Today the system is standard Navy routine.

With government demands satisfied, Sherman got permission to try the improved instrument in a few war plants. Industrial vision at last began to move. Tiffin established at Purdue a special course for training company personnel in applying the tests. The makers of the Ortho-Rator set up a plan for loaning instruments and giving expert, technical advice. Key plants east of the Mississippi were invited to join the work, and that is where the matter stands now.

A typical industrial vision success story is coming out of the Sperry Gyroscope plants today. Sperry took up the idea when expansion was forcing the company to hire hundreds of new workers a day, most of them inexperienced and untrained. In one assembly department a two weeks' training course had to be given, and, although standard performance tests were tried on each candidate, 20 per cent failed. The situation was causing a serious loss of materials, production, and time, as well as a great expense. Finally, visual-skill tests were tried on these recruits, and it was immediately found that much of the trouble lay in unsuitable eyes. Learners who became expert almost always turned in a certain visual pattern which those who failed did not have. By making the successful pattern a primary requirement for that inspection job, Sperry cut failures just as the Navy had done.

The company immediately expanded visual testing programs to all machine and inspection departments. Broadening still further, highly skilled older employees were tested for declining visual skills, and 40 per cent were found to be definitely in need of eye correction. These corrections were incorporated wherever possible in safety goggles already being worn. Visual-skill testing at Sperry has become a major factor in breaking a serious manpower bottleneck. A general over-all improvement in employee performance is expected when the program is finally completed. Sperry has found that at least 85 per cent of the workers who do not have the right vision for their jobs can get it by being fitted with proper glasses.

What are the visual skills that combine to make these patterns? The act of seeing is a combination of the action of eye muscles, nerve controls, and psychology not yet fully understood. The eye muscles themselves are as strong as the finger muscles, but the other two factors

hold the real secret of visual skills. Simplest talent of the eye is to focus sharply on objects several feet away. This far acuity is the basis of the old 20/20 test still generally used to define normal sight. But it is about as good, as a measure of near acuity, as the amount of gold in a man's teeth. The new system calls for tests at 13 inches as well as at 20 feet, and a low score in the former will throw any candidate outside of the pattern required for close work, no matter how superior he may be in far acuity.

For example, hosiery loopers thread half-finished stockings on rows of tiny needles to be knitted up on a machine. To see each needle they must work at eight inches from their eyes. Recently it was found that loopers with good far-acuity scores produced an average of 38 per cent less stockings per hour than workers with poor scores. But manufacturers had never known this. They had been relying on the old 20/20 test, trying out hundreds of girls by the hit-or-miss method. It takes a year to train a looper, and if she has to be dismissed it is a serious loss to all concerned. So little was this understood that one doctor found a number of nearsighted loopers and had them wear distance glasses all the time. They could not work until they had discarded the glasses altogether. Now, some mill operators use modern industrial vision tests, score every applicant carefully, and either give them occupational glasses or less exacting jobs.



Courtesy of Westinghouse Electric Corporation

Excellent example of the many industrial tasks requiring good vision for close objects is given by this micro-laboratory research worker.

Another misunderstood visual skill is the combination known as accommodation and convergence. Your eyes habitually focus somewhere near the object you look at and more or less point to it. If the error is slight you don't notice it; if it is considerable you may see double or blurred, or both. Conventional industrial eye tests take no account of these visual skills; a lack of them may go unnoticed until an accident or chronic headache sends you to a doctor. But good accommodation is important when you drive a car. If it takes you more than a tenth of a second to change focus from the dashboard to the road ahead, in a pinch you may not be able to avoid a collision. Quick accommodation is a prime necessity for fighter pilots, who must watch their instruments continually and yet be ready to pick up instantly an enemy plane in the distance. For both you and him, visual-skill testing is the only method of preparing for an emergency. If you know you lack the talent for quick eye changes, you can learn to be more than usually cautious.

Closely allied to these skills is stereopsis, or depth perception. Well-matched eyes, mental habits, and experience combine to give most people a good three-dimensional sense up to 300 feet. This type of vision is essential in jobs such as range finding, and good stereopsis can be increased by careful training. Both the Army and the Navy use special instruments to measure it. Many occupations do not require it, and a high score in this respect is unimportant. Stereopsis cannot be ignored, however, as sometimes the lack of it means death.

Stereopsis and convergence are the first two faculties to disappear in heavy drinking, and their loss probably accounts for most of the alcoholic accidents. Much more dangerous is the man without depth perception who gets a job to which stereopsis is important. There is the case of Jim T., a top-notch machinist in a locomotive works, who was made a crane operator when the regular man left. Jim, intelligent and highly responsible, smashed a $7,000-machine on his first day in the cab and crushed a man's foot with a load of steel plates on his second. On his third day, he knocked a man off a staging and killed him. Neither Jim nor his employer knew that he lacked stereoscopic vision until the visual-skill tests proved it. Jim's flat vision had cost the company thousands of dollars, and a fellow worker had lost his life. Now every worker in that plant is checked to see that his pattern is right for the work he does.

Eight per cent of men and 1 per cent of women are color blind, but color sensitivity varies widely and not infrequently between the two eyes of an individual. In the dyeing, printing, and paint industries, color perception is a major skill. This faculty may change from day to day, and it is believed to decline with age. Accurate scoring tests, still being worked out, will eventually tell whether a new employee has enough color sense to see him through his job as he grows older. If he starts off with a poor score, he can be put in work where high sensitivity will never be important. Color perception tests are already being used to indicate one's general health. Toxic conditions destroy this visual skill; when a worker suddenly becomes color blind he is sent to the hospital for a check-up. Often a major disease is then caught in its earliest stages, and serious trouble is avoided.

Almost universal is the dominant eye; commonly one eye leads and the other follows. There is no trouble if the difference is slight, but sometimes the poor eye, though perfectly good alone, refuses to team up with the good one. Then stereopsis is destroyed and sight may be confused. Accidents or poor workmanship usually follow. Thirty years ago a British investigator put a red glass over the good eye of a cricket player and nearly doubled his batting average by forcing that eye down to the level of the poor one. Few of us know it if one eye is inferior to or has different skills from the other. Even if we are almost blind on one side we may not realize it. But the old-style 20/20 eyesight test quickly spots the condition, and many thousands of "monocular" people have been refused jobs accordingly. The new tests, however, prevent this by allowing for it in the permissible visual pattern. A number of kinds of close work can even be done better by one-eyed people so long as depth perception is unimportant, and one-eyed workers, according to a recent survey in Massachusetts, almost never have accidents.

A man who had gone to night school to become a toolmaker had never held a position better than that of janitor because he had only one eye. When the plant for which he worked finally installed visual-skill tests, he qualified for and got the job for which he had trained.

However, persons with monocular vision may be dangerous as bus drivers or railroad operators. Many people normally have "tunnel vision" — they see little on the side and see well only straight ahead. Right-eye monoculars are all right in America but a risk in England. The American's good right eye will see a car approaching from the right and warn him to come to a stop when the time for avoiding an accident is short. Yet where traffic keeps to the left, he is practically blind on the side of greatest danger. Conversely, a left-eye-dominant driver is in danger in the United States. Sherman and Shepard hope that these lacks in visual skill will soon be taken into account in examinations for automobile driving licenses. They remind you of the man they once tested for a bad case of left-eye dominance. Driving to work after having been fitted with new glasses, he discovered there were houses on the right side of a street which he had always used. He had thought there was nothing there but vacant lots.

Industrial vision tests which show up variations in all the many skills are going to mean enormous gains for labor and management alike. In every plant where the system has been adopted the employees have clamored to be tested and retested. Their unions are solidly behind the idea because it means promotion to better positions and higher pay and especially because so many thousands of older workers can be kept on in jobs to which their seniority entitles them instead of yielding to younger men who formerly could turn in better performance. Management is enthusiastic for industrial vision because it immediately results in better shop efficiency, fewer accidents, and lower insurance rates, to say nothing of higher morale.

To apply visual-skill testing throughout the United States will be a gigantic task requiring the utmost cooperation of management, labor, and the ophthalmic professions. The principal hindrance will be that a majority of all workers are employed in plants too small for the program to be effective. The answer has been found by a Chicago oculist, Dr. Harry S. Gradle, whose Illinois Society for the Prevention of Blindness already offers to send teams into any plant in that state to do the visual testing for one dollar an employee. The teams include an expert operator with an Ortho-Rator and pattern cards, a plant efficiency psychologist, and a recorder. Tiffin's Purdue group offers to correlate the results and recommend changes in jobs where necessary. A special American Medical Association committee, under Dr. Albert C. Snell, and a similar committee of the American Optometric Association, headed by Dr. Richard Hall, are both co-operating fully. Such visual-testing teams, the doctors hope, will some day circulate all over the country; and, having cleaned up the situation in industry, they will go on to serve school children to whom only old conventional eye tests are now available.



Courtesy of National Society for the Prevention of Blindness

Depth perception is highly important for many kinds of industrial operations. The patient is undergoing tests which determine whether his depth perception is adequate for specific types of industrial jobs.

Meanwhile, Tiffin and Sherman and their associates are gradually building up a vast store of data from which they will some day be able to construct visual patterns for top performance in every occupation in the land. They see no reason why visual-skill tests should not become a regular part of eye examinations everywhere, and, to bring this day closer, optical manufacturers are constantly striving to improve instruments of measurement. The war has done much to hasten this improvement, but the greatest advances are sure to come when America realizes that we cannot afford to refuse a man a job because he fails to qualify on visual tests of 100 years ago.

Research on Minority Problems

Focused on Everyday Intergroup Relations in Different Settings, Realistic and Practical Collaboration of Scientists Brings Forth New Light on Minority Group Behavior

By Kurt Lewin

RECENTLY the community council of a town which is composed of a number of minority groups demanded advice. For six months the council had heard regular lectures on minority problems from scientific experts, and, as a result, this sentiment prevailed: Enough of science; now tell us what to do.

Such attitudes are probably more prevalent the more difficult the situation. However, a person who takes his clue from the experience of the engineer might be inclined to answer, "Action without knowledge of the facts and without understanding of the workings of the forces behind the facts is blind; the more difficult the problem is, the more necessary is research." World War II, and particularly the atomic bomb, has made it a matter of common knowledge that the natural sciences have far outdistanced the social sciences. Many people have become frightened. No good can come from an attempt to set the clock back and to retard natural science. Instead, we should realize that it has become a question of human survival to promote social science in such a way that both natural and physical science become equally vigorous and successful.

The blueprint for research on sound social management of local, national, and, to a degree, even of international matters can well be taken from research on physical engineering: Action should be based on knowledge of the factual situation and on unbiased insight into the laws governing the facts. As in physical engineering, social management of the intricate problems of modern society should be based on systematic, scientific experimentation. The scientific laws discovered in this way do not usually tell an unavoidable future, nor have they the character of rules for action to be applied in all cases. Rather, they provide principles which permit us to determine how the various situations can be dealt with rationally and effectively.

To handle the practical problem which a situation presents, the engineer frequently must bring together facts and conclusions which the scientist is accustomed to treat, for purposes of analysis, in separate branches of physics and chemistry. As the social sciences gradually move from the descriptive stage toward experimental procedures, they, too, are forced to see and to treat facts in line with their interdependence in concrete situations rather than as separate topics of either psychology, sociology, anthropology, or economics. The necessity of handling effectively the various branches of our own Army — as well as enemy and Allied groups, both military and civilian, all over the world — has done much to bring together these disciplines on problems of production, communication, organization, personnel selection, leadership training, propaganda, and psychological warfare.

Economists, psychologists, and anthropologists seem to be increasingly aware that the time has come for realistic, practical, and scientific collaboration. Government studies on bond drives have demonstrated the superior predictive value which the combination of psychological and economic methods has relative to economics alone. Market research, public opinion measurement, studies on psychological factors influencing the success of agricultural policies, anthropological studies on community resettlement in depressed economic regions, and studies on the factors determining changes in food habits all are important moves in this direction, although mere beginnings. To play its proper role, American diplomacy as well as American business will have to have a much deeper insight into the way the Chinese, the people in the Netherlands East Indies, and those in the South American countries think and act.

One problem which cuts across national and international lines and appears in one form or another in most of the economic, political, cultural, and organizational issues mentioned is the so-called minority problem.

The minority problem is not merely the Negro problem. Even if we add the names of the various ethnical and religious groups in the United States, such as the Armenians, the Greeks, the Italians, the Jews, and the Catholics, we have hardly circumscribed the field correctly. Properly, we should include the blind and the hard of hearing, the crippled war veterans, and, in a way, women and children. Scientifically speaking, the minority problem is but a part of a topic that deals with the effect of group status on group living. Viewed this way, the problem has an immediate relation to status differences in any organization or group and is linked to questions which sound management everywhere should be prepared to face.

The study of minority problems is not new. At first, scientists were mainly interested in finding the truth about equality or inequality of different groups or races. It seemed to have been assumed that prejudices would disappear and people would treat each other the way they should as soon as science could show objectively and conclusively what equality or differences exist between groups.

Scientists interested in minority problems, therefore, probed into such questions as how the intelligence of Negroes, Italians, Greeks, and American Indians compares with that of the American white second and third generations. Are there any differences in skills and abilities? What is the effect of bilingualism on the children of immigrants of various stocks? What differences in physique exist between groups, and how does living in America influence this physique?

From these studies, one conclusion seems to be accepted by most experts in the field: [1] The differences which exist today between the skill, knowledge, and conduct of the average member of various ethnic and religious groups in the United States are mainly the result of the fact that the children of each group grow up in different settings. Certain differences of temperament may be in part hereditary. However, given proper education and opportunities there is no indication that the level of ability of one group would be essentially lower than that of another. Certainly the amount of overlapping of abilities between members of different groups is more significant than any difference which group averages may show.

Let us assume that future studies would corroborate this finding. Would that settle the minority problems in the United States? We can say with certainty that such would not be the case. While stationed in England, an American soldier from the South might see a Negro soldier with a white British girl. He might know all the facts; he might firmly believe in American democracy and feel he "ought not to mind." In spite of his better self, however, he might feel outraged. A study just completed at Harvard [2] has probed into the effect of education on prejudice. It shows that knowledge about facts concerning Negroes is greater, both in the South and in the North, for college graduates than for high school and grammar school graduates. This better knowledge about Negroes, however, has relatively little effect on attitudes toward Negroes; prejudice seems to be more strongly affected by the social atmosphere (South or North) in which a person lives than by the knowledge he has.

We are slowly recognizing that the fundamental problems of minority questions are not objective facts about similarities or dissimilarities of groups but have to do with the ideas or stereotypes which the members of one group have, rightly or wrongly, about other groups. The problem of the objective properties of a group remains important, but it is only one of the questions to be considered for forecasting events or planning action.

[1] Arthur W. Kornhauser, "Should Negroes Have Equal Rights?" *The American Magazine*, August, 1945, p. 32.

[2] Babette Samelson, "Does Education Diminish Prejudice?" *The Journal of Social Issues*, I, No. 3, p. 11.

The examples just mentioned show that neither the values which the individual consciously accepts nor the facts he knows suffice to determine his action. What, then, dominates the form of social conduct? The answer seems to lie in the following direction.

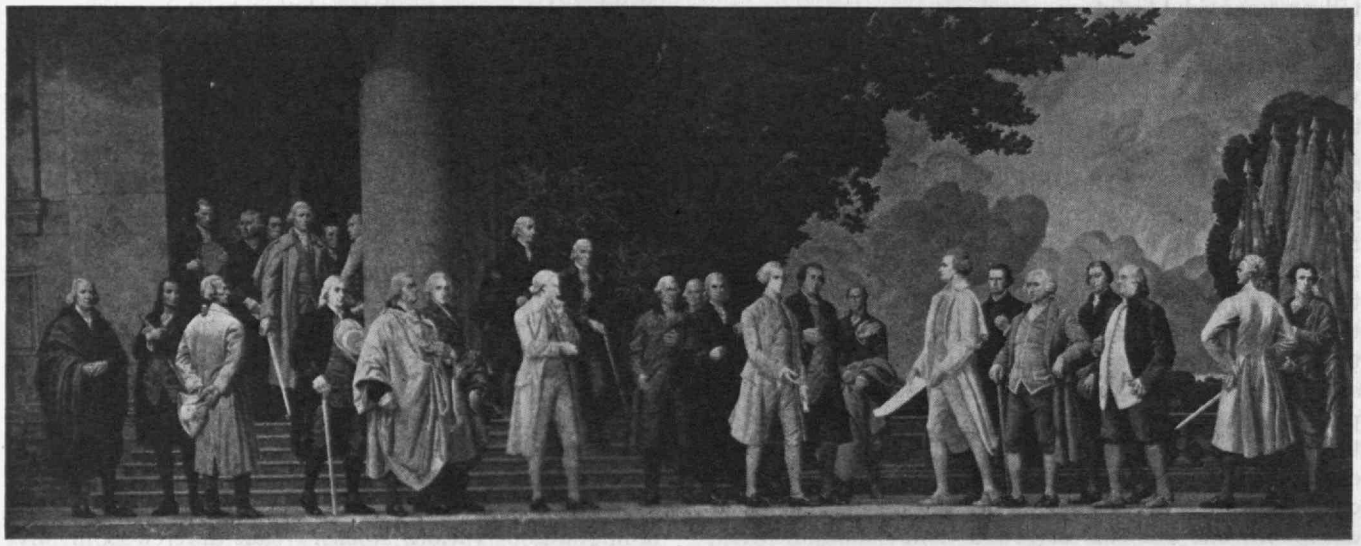
The driver who steers his automobile through traffic is guided from moment to moment by the position of his car within the street and the objects moving on it. If he sees that he is driving too close to the side or too much toward the middle of the road, he more or less automatically acts to correct his position. A child running unexpectedly into the road makes the driver jam on the brake. In other words, the individual's action is determined by the way he perceives his own position in his surroundings and by the perceived character of the various parts of his surroundings.

In a similar way, our social action is steered by our social perception. If an individual perceives another person or group as dangerous or repulsive, he will have an urge to avoid that person or group or to act negatively. If a person or a group appears attractive, the individual will tend to move socially toward him or it. Only to the degree to which our values or our knowledge change our perception of the social world will they change our everyday action.

To understand the behavior of minority or majority members we have to ask therefore what determines their social perception. This is one of the basic questions for future research. Today we can merely present illustrations.

Alfred J. Marrow and John R. P. French, Jr., who for a number of years have been experimenting with group problems in a sewing factory, report the following story.[3] Everybody in the sewing industry seemed to agree that women workers over 30 years of age are too old to handle the power-driven sewing machines. Management wanted to know how much money was lost on the average workers who had to be hired as a result of the man-power shortage. A study was conducted which showed that in all essential aspects of factory work, such as absenteeism, turnover, rate of production, and even rate of training, the average older woman worker (*Continued on page 182*)

[3] Alfred J. Marrow and John R. P. French, Jr., "Changing a Stereotype in Industry," *The Journal of Social Issues*, I, No. 3, p. 33.



Signers of the Declaration of Independence were among the first to recognize the rights of minority groups. This painting by Barry Faulkner is one of the murals in the National Archives Building in Washington.

Fortunes—Twenty Fathoms Down

Modern Engineering Techniques Give Promise of Retrieving Treasures Held for Centuries in Davy Jones's Locker

By Willy Ley

In 1911, tourists aboard English Channel steamers which passed the Dutch island of Terschelling at the mouth of the Zuider Zee could see a strange vessel in action. Its general outline was that of a small freighter, which indeed it had been originally. But there was something like a gigantic wire cage mounted at its stern. Into that cage led a big pipe, more than a foot in diameter, and from that pipe issued a continuous stream of sand, mud, and water, splashing through the wire netting and falling into the sea again. A similar big pipe led overboard from a point near amidships, and obviously the stream of water and sand came up from the sea through that pipe.

The tourists who saw this vessel were not puzzled for even one moment. They knew what it was and why it was there, because these activities had filled columns upon columns of newspaper space all over Europe. The freighter was the vessel *Lyons* of the National Salvage Association, and its job was to help salvage as much as possible of the fortune known to be aboard a sunken vessel. The fortune consisted of about $21,000,000, mostly in gold coins, and the name of the sunken vessel was *Lutine*.

There can be no doubt that the engineers of the National Salvage Association who tried to recover that fortune — and failed — had done an excellent job. There can also be no doubt that we could do much better today. The story of the *Lutine*, and especially of the difficulties of salvage after it rested on the bottom of the sea off Terschelling Island, will provide background from which we may evaluate the probability of recovering its treasure by methods of modern technology.

Originally the *Lutine* had been a warship, a fast-sailing and (for its time) heavily armored (32-gun) French frigate which, by the year 1799, was in British possession. It was in that year that a call for money reached England. The call originated from Hamburg, then a proud, free, and independent city which was growing rapidly because of the Napoleonic wars. Hamburg's merchants made huge profits but needed cash. British merchants were glad to lend the cash, for under prevailing conditions the success of Hamburg's merchants also meant profits for British firms. Several London banks got together $24,000,000, most of it in gold coin, the remainder in gold and silver bars. The fortune was loaded on the *Lutine*, and the vessel left Yarmouth Roads in the morning of October 9, 1799. Twenty-four hours later the *Lutine* was no longer afloat. A sudden change of winds had forced her to run in the direction of the Dutch coast, and near Terschelling she ran aground and capsized. Of the crew of 300 men only two sailors survived.

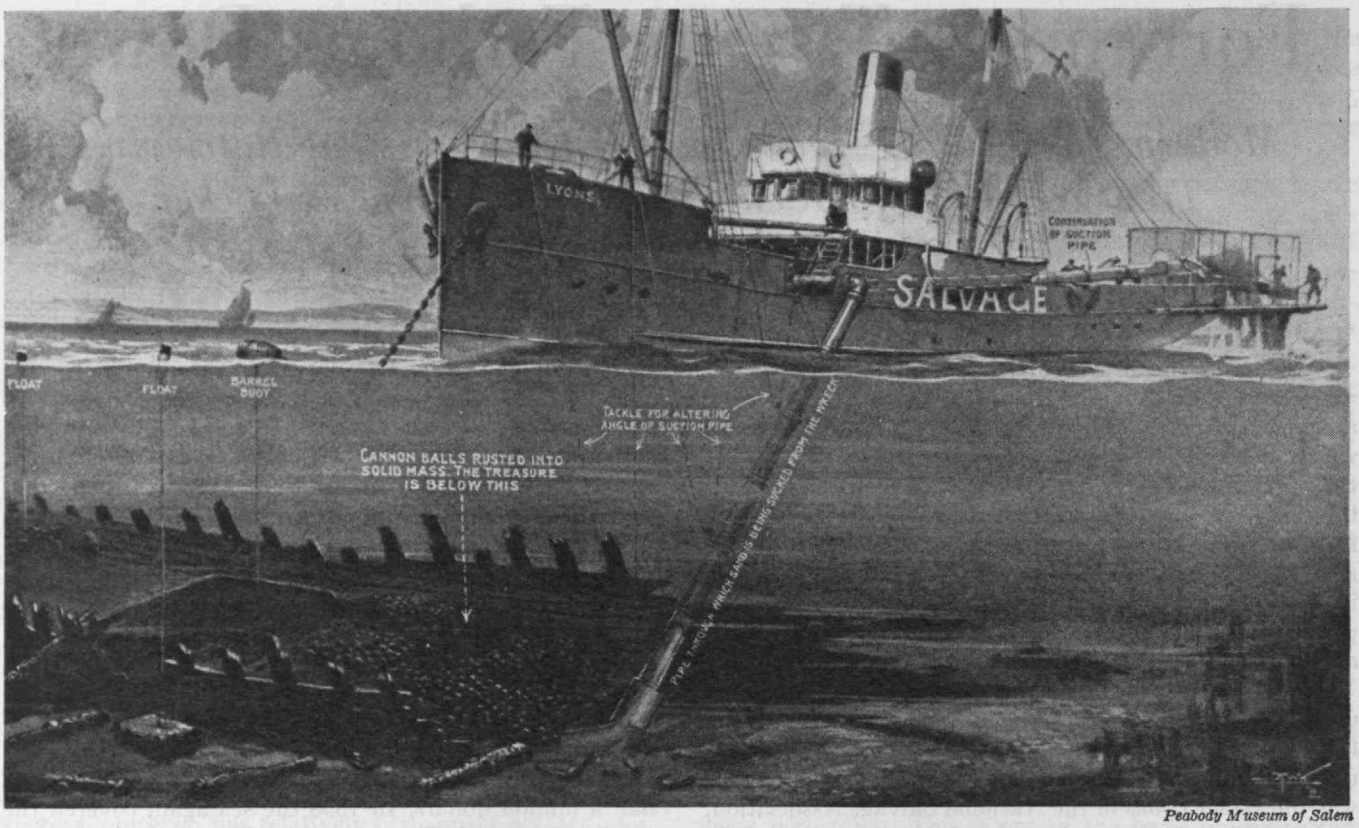
It was a black day for Lloyd's of London, for the *Lutine* had, of course, been fully insured. At the time, the Dutch Government was allied with France and at once confiscated the vessel, but it did nothing about the treasure for more than a year. There seemed to be no hurry; the wreck was easily visible, and at lowest tide a sufficiently tall man might actually reach it afoot. After a year or so the fishermen of the vicinity were ordered to extract the valuables, and they harvested more than a million dollars. But in the winter of 1801 the currents changed, and the wreck was buried under many feet of sand.

About 20 years later the firm of Lloyd's petitioned the Dutch king to return the rights to the *Lutine* to England, and the king presented the vessel (still sunk and buried) to George IV of England, who passed the present on to Lloyd's. But difficulties were in the way of salvaging operations, and everything seemed lost until in 1857 a new change in sea currents removed the sand from the wreck. A Dutch salvaging company, having an arrangement with Lloyd's, hired divers to approach the wreck, and the divers succeeded in removing gold bars valued at half a million dollars. In 1858 the sea again covered the wreck with sand. Divers could still get at the sunken vessel even though more work was required, and another $1,500,000 was salvaged. In time, the sand got too deep for Nineteenth Century operations, and after long waiting and several useless attempts the Dutch salvage firm gave up. That was in 1900.

A few years later the National Salvage Association, a British firm, began work. Their specially designed vessel was to remove the sand from the wreck by means of a centrifugal pump operated by the ship's engine. Sand removed from the wreckage was passed through a sieve for the purpose of recovering loose coins and other small valuables. New difficulties now presented themselves. The sea current heaped more sand on the wreck than the pumps could remove. However, this did not discourage the engineers, who had an alternate plan of producing a channel which would divert the current. It was a big job, requiring the movement of 1,500,000 tons of sand, but when this engineering feat was satisfactorily completed, then the removal of sand from the wreck itself would be an easy matter. In July, 1913, divers could feel bars of metal through a small hole in the ship's hull. They went for proper tools, and when they went down again they found that the wreck had turned over, covering the spot which would have given access to the treasure.

World War I then stopped the work, and no one has since tried to salvage the $20,000,000 still imprisoned in comparatively shallow water off the Netherlands coast.

The *Lutine* is by no means the only case of this kind. It would be easy to make a list of a hundred ships which sank with cargoes of gold and silver valued at more than a million dollars. Some of these vessels found a resting place in water far too deep for salvage. The *Titanic*, for example, with more than $20,000,000 aboard, rests under 2,500 fathoms of water. The resting places of others are only known approximately; but some are in comparatively shallow water at definitely known spots, like the



Peabody Museum of Salem

On October 9, 1911, the **London Illustrated News** ***reproduced the above illustration showing the method used by the salvage ship*** **Lyons** ***for raising the gold and silver bars and coins from the British frigate*** **Lutine** ***which sank in Netherland waters in October, 1799.***

Lutine off Terschelling, the *Laurentic* in 20 fathoms of water off the Irish coast, one of the ships of the Spanish Armada, the *Florida*, in Tobermory Bay (West Scotland), and others.[1]

In all these instances salvage is considered more or less impossible. In some cases, strong currents continually deposit sand over the wrecks or make approach impossible. In others, there is the danger that the wrecks may turn or collapse. Any one of the thousand and one possibilities which make divers' lives dangerous may make salvaging operations impossible.

However, the term impossible always applies only to a given stage in the development of technology and the engineering sciences. Change the stage, and the impossible becomes possible. Underwater engineering may soon be able to develop a new tool which will make many of the "inaccessible" wrecks perfectly accessible.

A diver is handicapped by two main limitations. One is water pressure, the other is human strength. To counteract water pressure, the air pressure inside the diver's suit has to be forced up to the same high value that prevails outside his suit. There is obviously a limit to what a man can stand, and that limit is reached even faster because of the bends, the dreaded and often deadly diver's sickness. Its cause is the strange fact that the nitrogen of the air will dissolve in the body fluids, especially the blood, under pressure. When the pressure is released it comes out of solution again, forming in the blood millions of tiny bubbles, which are the direct cause of the bends.

One can circumvent this trouble by decreasing the pressure very slowly. This procedure requires a diver who has to go to a comparatively great depth to spend hours descending and more hours coming up, with only a few minutes near his goal. Experiments made shortly before the war have shown that gases other than nitrogen are less soluble under pressure. A solution to the problem consists in feeding into the diving suit a different mixture of gas, such as helium and oxygen instead of nitrogen and oxygen. Although the ill effects of the bends are greatly minimized in this way, it is not an ideal solution, for there is still time wasted in descent and ascent.

Even if it were possible to find an ideal solution for overcoming the effects of pressure, the second handicap — general weakness of the human muscles — would still remain. A diver does not have the strength to fight a powerful current; he cannot lift heavy obstacles; he cannot dare to enter a wreck which may collapse around him. To overcome these limitations the diver requires an implement to protect him from water pressure and subsequent sickness, an implement which travels against a current by means of engine power, carries power tools, and in general protects him from mechanical dangers.

Modern engineering can do what the engineering of 1913 could not do. It can create a pressure-proof tank which can crawl along the sea bottom, approach wrecks, travel around them, and even crush their sides if necessary. It will afford the divers complete pressure protection as well as protection against such accidents as collapsing wrecks, not to mention attacks by sharks and other marine creatures.

In general appearance such a submarine craft might greatly resemble a heavy military tank, minus its armament. The armor would not be shed but would be more evenly distributed all around, since weight is not only unimportant but is actually welcome. The weight should be such as to provide enough (*Concluded on page 180*)

[1] Stanley Rogers, *The Book of the Sailing-Ships*, "Treasure Ships" (London: George G. Harrap and Company, Ltd., 1931), p. 251.

Science and the Civil War

First Large-scale Organization of Technical and Scientific Resources of Man Power during the Civil War Marks That Conflict as the Turning Point in the Technology of Warfare

By I. Bernard Cohen

ONE frequently encounters the statement that war is one of the most important influences in the development of science and technology. Countless examples seem to prove this statement. To cite but two, Galileo's interest in projectile motion arose from the needs of artillery, and, more recently, brain surgery was created on the battlefields of World War I. History records the introduction of new devices of warfare just as it records the development of military strategy. The ancient world witnessed the Trojan horse, Greek fire, and the burning mirrors of Archimedes. Yet it can hardly be said that scientific or technological innovation was the sole cause of winning or losing any war — even that which was recently concluded.

The Civil War [1] affords some very good examples of the growing importance of technology in warfare. This great and terrible conflict is marked off clearly from all of its predecessors by several factors. Among them, two are outstanding: the technological and scientific innovation accompanying that struggle and the organization on a large scale of scientific and technical resources of man power. The first of these was recognized by such foreign powers as Sweden, England, France, and Prussia, each of which countries sent military observers to report on the activities of the Northern forces; the Prussian observer was Ferdinand von Zeppelin. These observers witnessed the first effective use in warfare of the railroad and the telegraph and the introduction of large rifled cannon, telescopic sights, armored or ironclad warships,[2] rotating turrets for naval guns, fixed ammunition with conoidal bullets and percussion caps, breech-loading repeating small arms, a form of the machine gun, moving hospitals and an extended medical field service, balloon observation of artillery fire and balloon photography, the submarine, poison gas and liquid fire, the use of concentrated foods, and machine-made uniforms and shoes.[3] Many of these novelties were thus used for the first time in history; certainly others were employed on an unprecedented scale and with new effectiveness. Two of these alone — the ironclad and the machine gun — would have been sufficient to revolutionize the subsequent history of warfare on land and on sea.

And yet it can hardly be argued that the war was won through any one of these innovations or through any combination of them. The Civil War was not won or lost by superiority of arms nor by superiority of strategy. The Confederacy was blockaded and, despite the valiant efforts of the blockade-runners, obtained few supplies from the outside. Insufficient knowledge, and practice of subsistence agriculture and industry, produced a condition in which there were not only poor supplies of direct military equipment, such as arms and ammunition, but the essentials, such as food, clothing, and shoes, were so few that it may be considered a miracle that they were able to continue in the field at all during the last year. During the first years, superiority of strategy was all on the Confederate side. When the Union strategy improved in the last years, to all extents and purposes victory was already won by attrition.

Many of the new instrumentalities of war were introduced as experiments. Some were unsuccessful and were discontinued after a short period. Yankee ingenuity and inventive genius had a holiday, and if the South seems to have produced fewer innovations, this deficiency was perhaps due more to the inability to manufacture than to nonfertility of the inventive imagination. If innovations were not the principal cause of the war being won or lost, they nevertheless did transform the art of warfare. The Civil War was indeed the first war of mechanization and of large-scale movement of men and supplies. In this light, we have no cause for wonder in the oft-repeated statement that the German high command in the Twentieth Century made extensive studies of the technical aspects of the American Civil War.

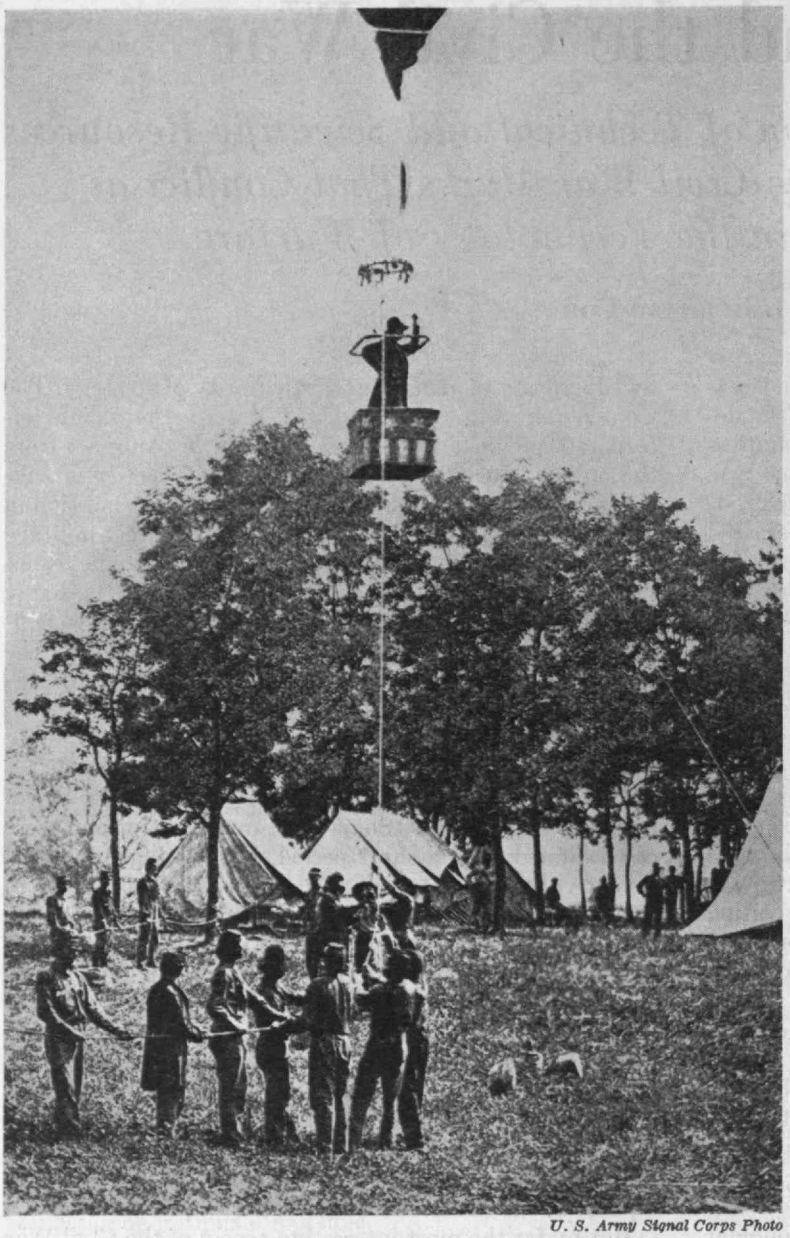
But by far the most interesting aspect of the Civil War was the organization in Washington on March 3, 1863, of the National Academy of Sciences as the first scientific brain trust. This organization still exists and today plays a vital part in our national scientific life; its part in the recent war is strategically important, although now it is no longer the chief agency for directing war research. But before recounting the story of its foundation and the account of its activities, let us first examine certain aspects of the war itself and discover the conditions that made the creation of this body imperative.

New tactics, based upon the new instrumentalities of war, not only altered the actual conduct of war but also had their effect upon one of the scientific branches of the service, that of medicine. At the time of the war, American military medicine was completely inadequate to meet the new situation. Infantry warfare had been greatly affected by improvements both in firearms and in munitions. The result was a great increase in the range and rapidity of fire, and tactics were adjusted accordingly. Danger at the front increased in depth, and the greater precision in firing of the new arms brought about a thinning and lengthening of the battle lines. As a result, the

[1] The scientific activities of the Confederacy were ably discussed by George Fort Milton in "Conversion and the Confederacy," which appeared in the January, 1944, issue of The Review.

[2] Details concerning the introduction of the ironclad warship are omitted since this subject is sufficiently well known, especially through the famous battle between the *Monitor* and the *Merrimac*.

[3] Roger Burlingame, *March of the Iron Men, A Social History of Union Through Invention* (New York: Charles Scribner's Sons, 1938), p. 428.



U. S. Army Signal Corps Photo

Thaddeus S. C. Lowe, making a balloon ascent at the Battle of the Seven Pines, as photographed by Matthew Brady.

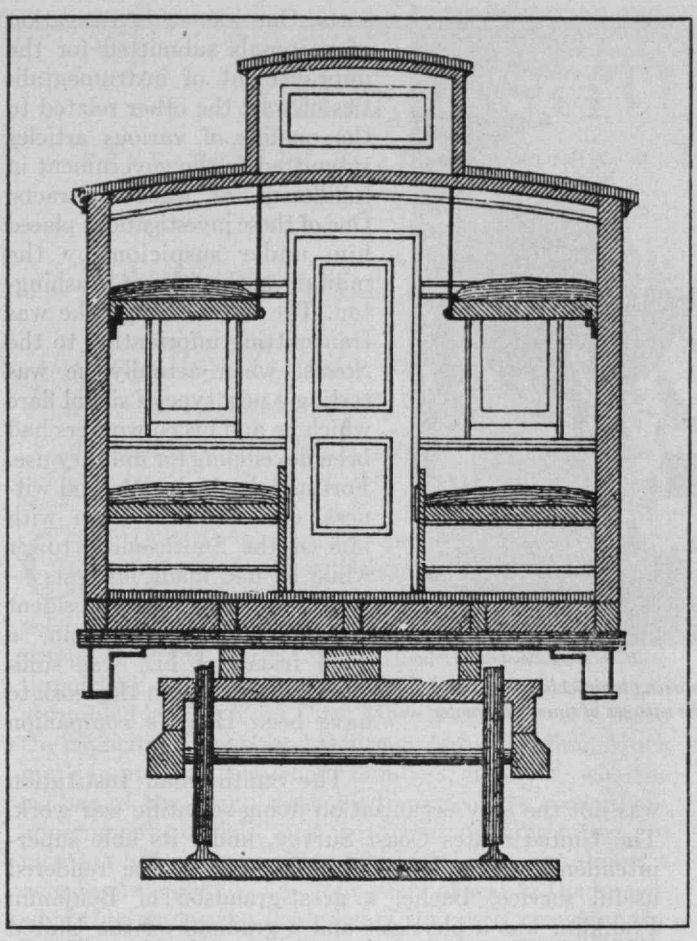
wounded were scattered over a much larger area than ever before.

The chief defect of the Army's medical system was its strict regimental organization and immobility. Rigid regimental organization produced conditions in which the medical personnel of one regiment might be overwhelmed with casualties while that of a neighboring regiment could be completely unoccupied. It also required each regiment to retain a quantity of bulky medical supplies and equipment, since the wounded were kept with their own regiment. That this seriously impaired the regiment's mobility and effectiveness seems manifest to us, but the situation was very difficult to correct. Although plans for improving the medical service were submitted by Surgeon General William Alexander Hammond, the one which was first put into action was that of the medical director of the Army of the Potomac, Dr. Jonathan Letterman. In August, 1862, General George Brinton McClellan adopted Letterman's plans which, among other things, called for an independent ambulance corps for each army corps. An ambulance corps was a battle necessity, not only a humane one. Without it, a man wounded in an engagement would be carried off by his own comrades in arms, who would not usually return to the front until after the battle was over. The number of men carrying off a comrade was rarely limited to the necessary minimum. It was not uncommon for four, five, or even six soldiers to carry to the hospital a man so slightly wounded that he could actually march as well as his military and comradely escort.

Letterman's corps was formed and equipped with ambulances and litters, a medicine wagon, and a mounted personnel of officers and sergeants. Transportation was strictly limited to the sick and wounded; only duly authorized persons were allowed to accompany the sick and wounded to the rear, whether on the march or during a battle. The Letterman plan co-ordinated the work of the mobile ambulance and medical corps with that of the field hospitals, operating under canvas behind the lines, and the base hospitals. One month after it began operation, the new service proved its value at the Battle of Antietam, and later General Grant adopted the essentials of the system for the Army of Tennessee. Finally, if tardily, the plan was formulated into law by Congressional Act of May 11, 1864, establishing a uniform system of ambulance service throughout the military forces. Few of us realize that our present-day civilian ambulance service originated in the Army.

Another development which occurred during the Civil War and which facilitated Letterman's plans for increased medical service to wounded soldiers was the introduction of hospital trains. At that time, Pullman cars were unknown, and coaches were not too comfortable, judged by modern standards. Nevertheless, the needs of the time led to the invention of hospital cars capable of transporting the disabled. The hospital cars of Civil War days usually took the form of a freight or passenger boxcar, provided with upright stanchions capable of supporting the stretchers on which the soldiers were placed. One such mobile hospital, known as the Harris car, provided rubber suspension rings into which the handles of the stretcher could be inserted, as shown on page 169. Stretchers were placed one above the other in as many as three tiers. In a hospital car of the Army of the Cumberland, attributed to Dr. Cooper and Dr. Herrick, we recognize the beginning of construction resembling that of the Pullman car. Horizontal cots or beds, supported from the floor on either side of the aisle, are comparable to the lower berths. Cots or stretchers were supported in fixed positions from the roof, somewhat like permanently affixed upper berths.

An extraordinary opportunity for studying and treating various types of injuries to man's nervous system, arising from gunshot wounds and other causes in war, was presented to medical men during the Civil War. The war practically created the profession of neurology in America just as the profession of psychiatry truly arose out of World War I. William A. Hammond, surgeon general



Transverse section of hospital car of the Army of the Cumberland affords hitherto unknown convenience for transporting battle casualties.

first of the issues of science and technology and the war. The occasion was the suggestion by Thaddeus S. C. Lowe that a balloon corps be used for Army reconnaissance. Henry reacted warmly to Lowe's ideas and informed him on May 1, 1861, that balloon observers would be "of advantage to the government in assisting their reconnaissance. . . ." President Lincoln placed the matter in the hands of the Secretary of War, Simon Cameron, who turned to Henry for scientific counsel. While awaiting an answer, Lowe delighted the citizens of Washington by making trial ascents from the grounds of the Smithsonian Institution and also from the White House lawn.

On one occasion he sent a telegraphic message, the first such communication ever to be sent from the air, which was reproduced in many of the newspapers throughout the land. It read:

Balloon *Enterprise*,
June 1, 1861.

To the President of the United States:

Sir:

This point of observation commands an area nearly 50 miles in diameter. The city, with its girdle of encampments, presents a superb scene. I have pleasure in sending you this first dispatch ever telegraphed from an aerial station, and in acknowledging indebtedness for your encouragement for the opportunity of demonstrating the availability of the science of aeronautics in the military service of the country.

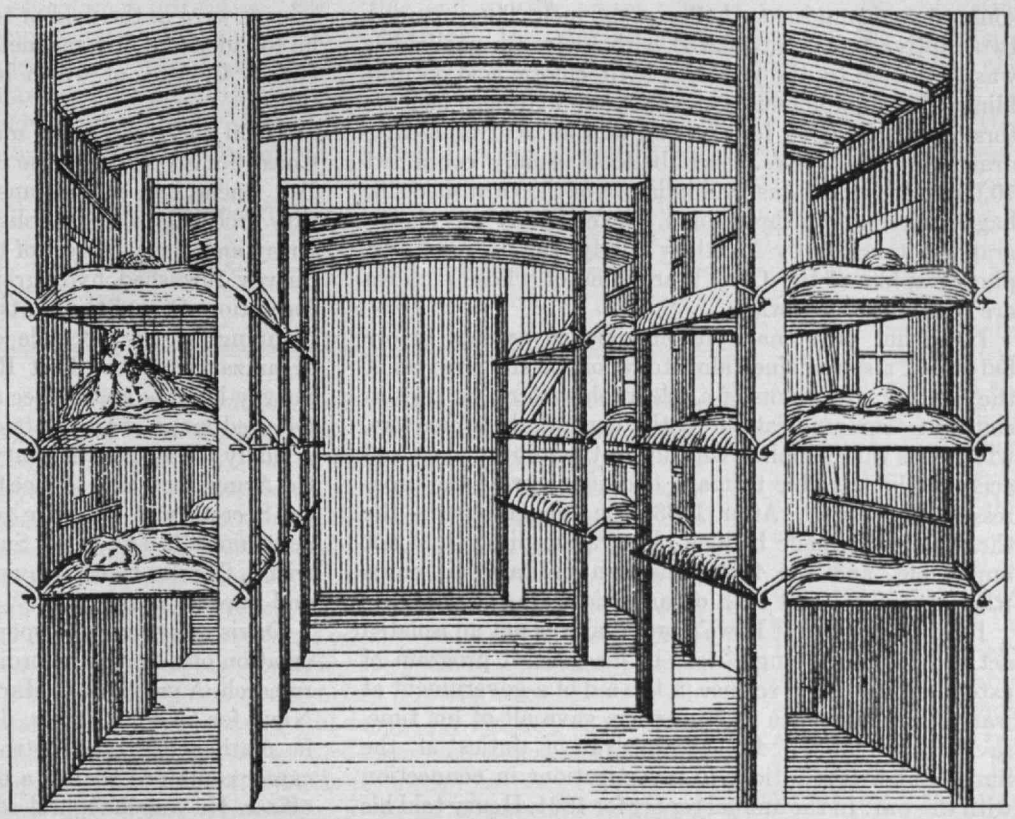
T. S. C. Lowe [4]

In this ascent, a reel with half a mile of fine copper wire, insulated with green silk, was placed at the ground station. One end was attached to a pocket-size Morse

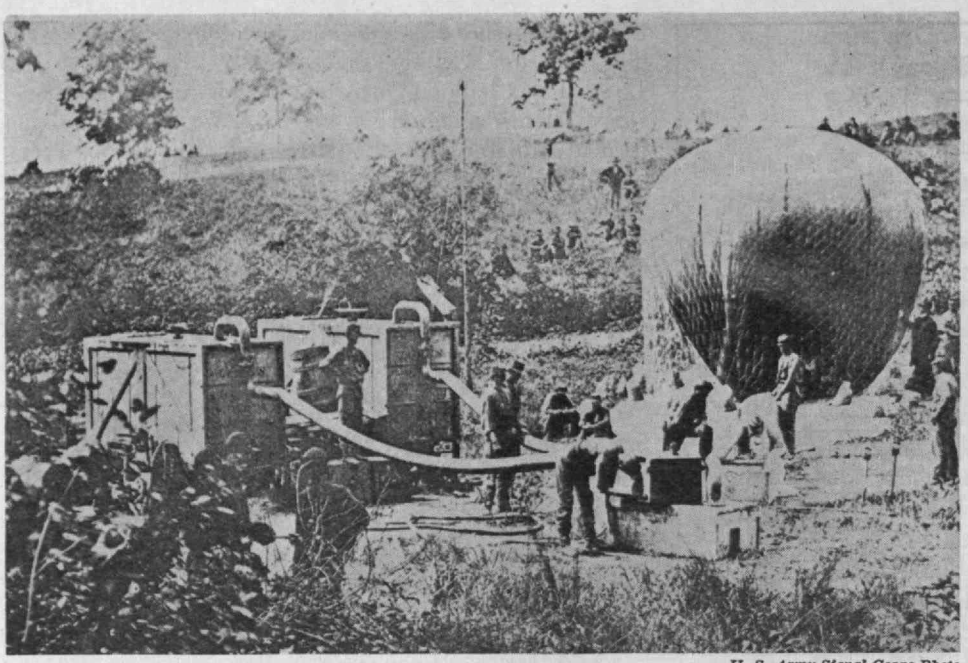
[4] F. Stansbury Haydon, *Aeronautics in the Union and Confederate Armies* (Baltimore: The Johns Hopkins Press, 1941), I, 175.

during the Civil War years, emerged from the war an accomplished neurologist. In 1863 when he placed S. Weir Mitchell in charge of a Philadelphia hospital, the patients of which were all soldiers suffering from nervous disorders arising from the war, Hammond introduced the most renowned neurologist of them all. Mitchell's successful researches into the treatment of such nervous disorders established him as one of the leading neurologists of the world, although today he is remembered by most of us for his many excellent novels.

One of the most active leaders in the scientific activities of the republic during the war years was Joseph Henry, Secretary of the Smithsonian Institution and discoverer of many important principles in the field of electromagnetism. Henry was connected with one of the



The official records of the War of the Rebellion show this illustration of a railroad car converted for hospital use. Apparently little attention was given to considerations of comfort.



U. S. Army Signal Corps Photo

Technique used for inflating a balloon by means of hydrogen generators using hydrochloric acid and iron filings. This historic photograph by Matthew Brady has suffered the ravages of time to a greater extent than some of his other photographs.

telegraph key and sounder in the balloon. The other end of the reel was connected to the telegraph lines between the War Department and the Alexandria office of the telegraph company, with an extension to the White House. The battery was in the War Department.

When finally established as part of the Army, the balloon company was commanded by Lowe, who held a captain's commission, and consisted of a junior officer and some 50 noncommissioned officers and men. They manned two captive balloons, inflated with hydrogen gas which was generated by the action of hydrochloric acid on iron filings. The equipment consisted of two hydrogen generators, each drawn by four horses, and an acid tank-cart, drawn by two horses. Each balloon usually contained 20,000 cubic feet of gas, and inflation of the varnished silk bag required about three hours. The company was photographed in action by Matthew Brady, the distinguished photographer of the Civil War, some of whose pictures are reproduced herewith.

Lowe not only made reconnaissance ascents before battle but also remained aloft to report on the progress of the fighting. By means of a telegraph system, he kept in constant communication with general headquarters, which was thus supplied with up-to-the-minute news and accordingly was able to make decisions during the progress of the battle. After 1863, the topography of the theater of war made balloon observation difficult, if not impossible, and the first American military air corps (though not the first such organization) was disbanded.

Henry's support of Lowe's proposal was not an isolated act, but rather a single item in his general program of extending the use of science in the aid of a government at war. Throughout the war years he gave all of his time, save that required for administrative duties at the Smithsonian Institution, to investigations in connection with the war. In the annual report for 1864, Henry told his fellow citizens that he had prepared several hundred reports "requiring many experiments." These were of two sorts: One was an investigation of proposals submitted for the improvement of instrumentalities of war; the other related to the quality of various articles submitted to the government in fulfillment of legal contracts. One of these investigations placed him under suspicion by the military authorities of Washington. The latter thought he was transmitting information to the *Secesh*, when actually he was testing a new type of signal flare which he and his co-workers had been developing for military use. Fortunately, he had a good witness, one who had been with him in the Smithsonian tower while he had made his tests — none other than the President himself. Abraham Lincoln, a good friend of his, was sufficiently interested in the work to have been Henry's companion on the occasion.

The Smithsonian Institution was not the only organization doing scientific war work. The United States Coast Survey, under its able superintendent, Alexander Dallas Bache, likewise rendered useful service. Bache, a great-grandson of Benjamin Franklin, was a physicist and a graduate of the United States Military Academy. He had taught at West Point and had also been professor of natural philosophy at the University of Pennsylvania. His greatest contributions to science were in the field of terrestrial magnetism. In 1840 he founded the first magnetic observatory in America at Girard College, of which he was president for a short time.

When the war began, many people thought that the Coast Survey would cease its activities for the duration. But Bache had other plans. To determine coastal military proceedings, he established a commission, containing Army and Navy officers of high rank, to which the Coast Survey furnished hydrographical and topographical information. One of the fruits of this collaboration was the planning of the blockade of the Confederacy and the organization of the Port Royal Expedition. The Coast Survey likewise made special surveys and drew and distributed maps of the seats of war. He and his assistants actually performed the duty of a topographical corps to the Army, for which service thanks were forthcoming from the Secretary of War, the general in chief, and the President himself. The Coast Survey, in the words of Bache's friend, Charles Henry Davis, was "never so distinguished and important as now."

Davis was the man responsible for finally achieving the creation of a central co-ordinating body for war scientific research. A graduate of Harvard College, Davis chose the Navy for his life's career, doing further study, especially in mathematics and astronomy, between cruises. His career combined that of a man of science and a practical officer. He was inaugural editor of the *American Ephemeris and Nautical Almanac*, established by an act of Congress in 1849, a publication (*Continued on page 192*)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Dr. Compton's Fifteen-Year Presidency Celebrated

Alumni Pay Tribute to the Leadership Which, since 1930, Has Materially Advanced the Institute's Service to the Nation

GATHERED to greet Dr. and Mrs. Karl T. Compton on Wednesday, December 5, at a dinner held in the Grand Ballroom of the Hotel Biltmore in celebration of Dr. Compton's fifteenth anniversary as president of the Institute, was the largest and most distinguished congregation of Technology Alumni ever assembled in New York City. More than 600 guests taxed the capacity of the Grand Ballroom to overflowing. Much more important than mere numbers, however, was the caliber of the group assembled — scientists, executives, government officials, and academic administrators, to mention but a few — who could look back over almost a decade of depression and four years of war in the knowledge that under the guidance of its ninth president the Institute was completing the greatest era in its distinguished history. Possibly also the Institute was concluding a phase of research, education, and national service unparalleled by any other educational institution. For such opportunity to serve our country we may all be grateful. But the dinner, planned by the Technology Club of New York, had been arranged to honor the Institute's leader during these troubled times and to celebrate in good fellowship the decade and a half of Dr. Compton's presidency.

The success of the meeting was in large measure the result of the enthusiasm of C. George Dandrow, '22, President of the Technology Club of New York, who served as toastmaster for the occasion.

First speaker of the evening was Major General Leslie R. Groves, Jr., '17, who drew on his experience as head of the atomic bomb project in presenting briefly but dramatically a picture of the magnitude of the organization involved as well as the co-operative effort put into effect in making the Manhattan District project the success it was. As a supplement to General Groves's talk, a motion-picture film was shown of the destructive effects of the three atomic bomb explosions so far recorded in history.

A. Warren Norton, '21, President of the Alumni Association, paid warm tribute to Dr. Compton's part in so ably directing the affairs of the Institute not only during the war but also during the decade prior to the war.

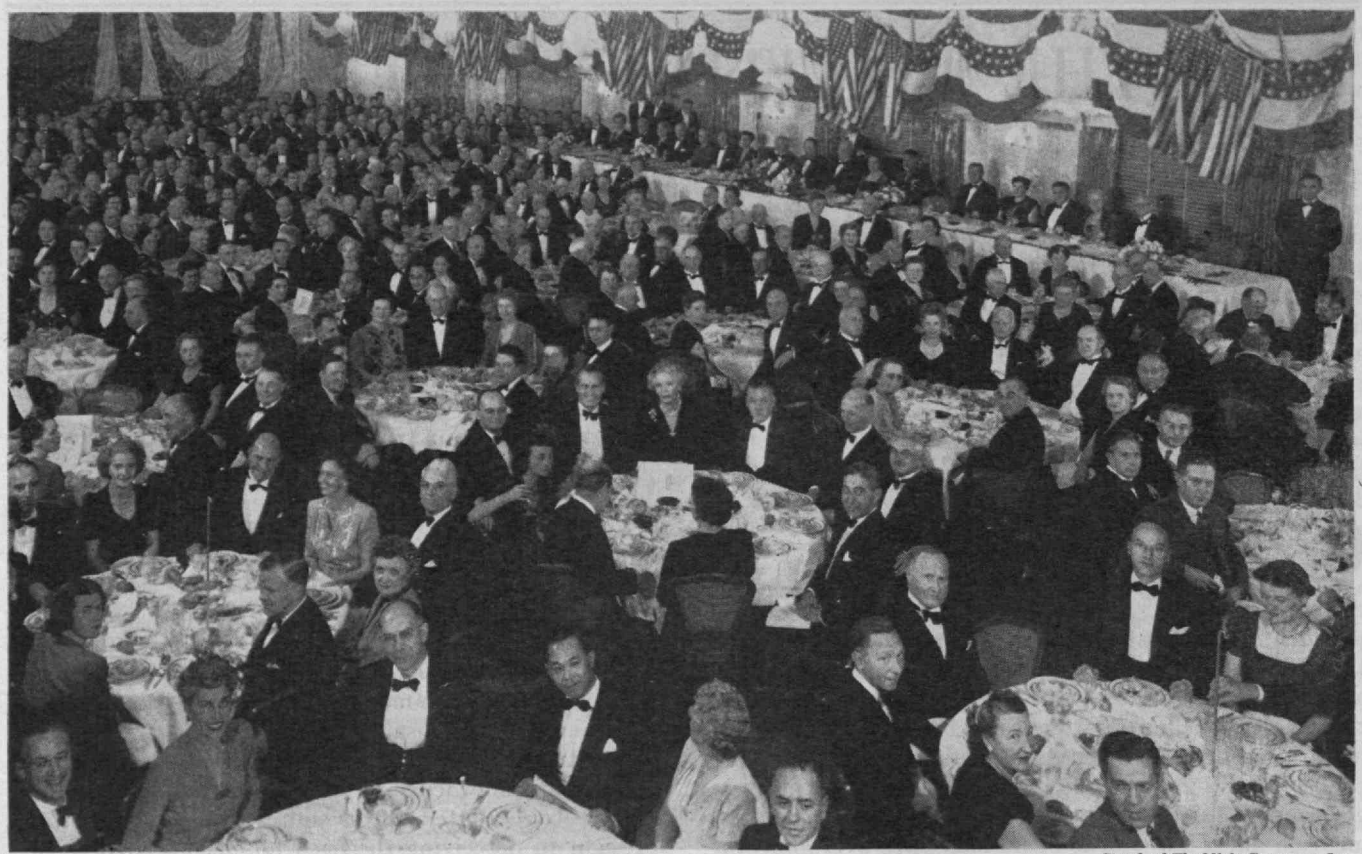
Horace S. Ford, Treasurer of Technology, then gave a delightful and intimate picture of the Institute and its personalities as they have developed under the guidance of Dr. Compton, to whom he referred as the "number one man."

Bradley Dewey, '09, former President of the Alumni Association and a life member of the Corporation, gave a discriminating appraisal of Dr. Compton as a man, an administrator, and a scientist. Mr. Dewey's talk reflected his intimate knowledge of Dr. Compton in all of these roles. Ably recounted in this address was Dr. Compton's foresight in perceiving the need for placing greater emphasis upon the more fundamental sciences and for harnessing them to engineering with resulting advantages to both. Outlined also was Dr. Compton's conviction that the scientist, engineer, and architect must be, in the best and widest sense, professional men, socially responsible and socially aware citizens. Out of this conviction has grown the achievement of broadening the entire basis of the Institute's educational program in which new emphasis has been placed on the humanities.

Prior to the introduction of the guest of honor, Mrs. Compton was presented with a beautiful crystal vase, symbolic of the fifteenth anniversary, by Alfred T. Glassett, '20, formerly President of the Technology Club of New York. In response to Mr. Glassett's presentation and well-worded tribute, Mrs. Compton captivated the gathering with her gracious acknowledgment.

Following a spontaneous ovation, Dr. Compton thanked the speakers for their kind remarks and with characteristic modesty shared with his able and loyal Faculty and administrative staff the honor for the great accomplishments of the Institute. After briefly covering several interesting and personal anecdotes of his trip to the far Pacific, Dr. Compton projected into the future his hopes and ambitions for a greater and more

> "*. . . Let me emphasize the supreme necessity of maintaining a faculty of absolutely first grade men, despite the increasing difficulty of doing so. Here, as in every organization, the question of personnel is the supreme issue. But, unlike other organizations, an educational institution can make a perfectly logical and unanswerable argument that its needs of the best men should supersede the claims of any other organization. For it is these men in the educational institutions who train and inspire all the others; their abilities are renewed and made available to the world in every graduating class. The folly of sending our youth to second rate teachers in the hope of obtaining a first-class training is too absurd to discuss. And yet this is a very real danger, for industry is competing with universities for the best men, often taking them and then perhaps later finding fault with the institution for not giving its students a first-class training!*"—From Dr. Compton's Inaugural Address, June 6, 1930.



Standard Flashlight Company, Inc.

Taxing the capacity of the Grand Ballroom in New York's Hotel Biltmore, more than 600 Institute Alumni gathered to honor Dr. Compton's fifteenth anniversary as president of the Institute. Those at the head table (left to right) are: George W. Kittredge, '77, Mrs. C. George Dandrow, Gerard Swope, '95, Mrs. Gordon S. Rentschler, A. Warren Norton, '21, President of the Alumni Association, Mrs. Gerard Swope, Horace S. Ford, Treasurer of the Institute, Mrs. Bradley Dewey, Dr. Compton, C. George Dandrow, '22, President of the Technology Club of New York under whose auspices the dinner was given, Bradley Dewey, '09, Mrs. Compton, Major General Leslie R. Groves, '17, Gordon S. Rentschler, Mrs. A. Warren Norton, Alfred T. Glassett, '20, Mrs. Joseph Elliot, and James C. Duff, '86.

effective Technology. High on the list of immediate requirements are a new library, a new gymnasium, new laboratory facilities, and new dormitories.

The dinner ended with the singing of the Stein Song with Frank D. Gage, '22, at the piano and John H. Teeter, '22, leading the singing, and thus was concluded one of the most auspicious Alumni gatherings in many years. Those who were fortunate enough to be present carried away with them the warm feeling expressed in the program dedication, addressed to Dr. Compton, which, in part, read:

Tonight your friends are gathered here to celebrate the Fifteenth Anniversary of your presidency of the Massachusetts Institute of Technology;

— to show our affection for your warm, modest, human qualities which have so gracefully cloaked your great accomplishments;

— to express our sincere appreciation for your inspiring leadership and outstanding contributions to the Massachusetts Institute of Technology;

— to honor you for your selfless devotion and aid to our country during these past trying years;

— to assure you of our continued confidence, good wishes and support as you carry to new heights your life's work as scientist, educator, administrator and humanitarian.

Chemical Warfare Service Head

NEW honors have come to Brigadier General Alden H. Waitt, '14, whose nomination by President Truman to the post of major general heading the Chemical Warfare Service has recently been approved by the Senate. After active duty in World War I, General Waitt entered the C.W.S. in 1920 and is now one of the few original World War I officers of that branch remaining in the Regular Army. Continuing in the C.W.S. first as executive officer and chief of field service in 1942 and 1943 and then as assistant chief in charge of field operations from May, 1943, to September, 1945, General Waitt now heads that branch of the Army Service Forces as chief of the Chemical Warfare Service. He succeeds Major General William N. Porter, recently retired. During World War II General Waitt served in both the European and the Asiatic theaters.

On November 5 General Waitt was awarded the Distinguished Service Medal for "exceptionally meritorious service in a duty of great responsibility" and also the Legion of Merit, the citation for which states that General Waitt "displayed great initiative, organizing and training ability, and talents of the highest order in developing the Chemical Warfare Section of the Armored Force Board, School, and Replacement Training Center and in preparing the units of the new army to meet gas offensively and defensively."

General Waitt is the author of *Gas Warfare,** which is accepted as the standard book in the field. He has also written numerous magazine articles, including "Smoke, But No Fire," which appeared in The Review for December, 1943, page 85.

* *Gas Warfare; the Chemical Weapon, Its Use, and Protection against It* (New York: Duell, Sloan and Pearce, Inc., 1942).

Vice-president

THE appointment of James R. Killian, Jr., '26, Executive Vice-president since July 1, 1943, to the advanced post of Vice-president of the Institute and secretary of the Executive Committee of the Corporation has been announced by President Compton.

After his graduation from the Institute, Dr. Killian was associated with The Review for 13 years, as assistant managing editor from November, 1926, to November, 1927, and managing editor from November, 1927, to October, 1930. He served as The Review's seventh editor from October, 1930, until January, 1939, when he became Executive Assistant to Dr. Compton. In July, 1943, he was made Executive Vice-president.

Dr. Killian was born in Blacksburg, S. C., in 1904 and studied for two years at Duke University before coming to the Institute. In June he received the honorary degree of doctor of science from Middlebury College.

A fellow of the American Academy of Arts and Sciences and a member of the Society for the Promotion of Engineering Education, he is a member of the St. Botolph Club, the Club of Odd Volumes of Boston, the Technology Club of New York, and Sigma Chi fraternity.

Widely known among the Alumni, he is a former treasurer of the Alumni Association and is secretary of his class. His administrative duties include the chairmanship of the board of publications of the Technology Press.

Placement Assistance

A PROGRAM for providing assistance to veterans and others engaged in wartime projects who are returning to employment in postwar civilian activities has been completed by the executive committee of the Alumni Association and is now in operation by the majority of Technology clubs throughout the country. The plan of operation calls for committees of local clubs to survey employment opportunities in their regions and to interview Alumni who are seeking employment. It is the objective of the local committees to act in an advisory capacity in establishing local contacts for those who have been engaged in noncivilian activities during the war. It is the purpose of these committees to assist both individuals and business groups to meet their employment requirements in the postwar readjustment period, although the committees cannot guarantee jobs for those returning to civilian occupations. Nor is the program intended to serve those already employed but who wish to change their occupation; such cases will be handled, as before, by the Institute's Placement Bureau. A list of placement chairmen in 34 states and in the District of Columbia appears on page 200 of this issue of The Review. Service personnel as well as engineers displaced from war industries who are interested in postwar employment are referred to these placement chairmen for further information.

The Alumni placement program is the culmination of more than three years of preparation to meet postwar needs. Looking forward to the end of the war, the executive committee of the Alumni Association began in July, 1942, to stimulate all Technology clubs to establish special committees to deal with postwar placement problems which, it was foreseen, would arise upon the conclusion of hostilities. As a result of this early planning under the direction of Charles E. Locke, '96, Secretary of the Alumni Association, the necessary steps were taken to develop a simple but complete and effective organization so that the Technology clubs were able to function when the war ended.

In January, 1945, an Alumni Postwar Placement Committee was appointed which co-operated with the Placement Bureau. This committee consisted of Raymond H. Blanchard, '17, chairman, Harvey S. Benson, '12, William L. Taggart, Jr., '27, George E. Shrigley, '30, and Paul Pigors, Associate Professor of Industrial Relations, secretary and recorder. The procedural plans worked out by this committee called for activity of Technology clubs as outlined above and their co-operation with other placement organizations in their communities to enable them to make the necessary contacts for war workers. To carry the plan still further, Ralph T. Jope, '28, Business Manager of The Review and Treasurer of the Alumni Association, has been appointed co-ordinator of these activities at the Institute until the return of Captain John N. Higgins, '31, who is now on leave of absence.

Visiting Committee Report

THE Committee on Museum * received from John E. Burchard, '23, Director of Libraries, a memorandum on Institute museum policy and program, which outlines a proposed policy for the Museum, a program of implementation of that policy over several years, and an immediate program for the present year. The Committee has in general concurred with these recommendations and has forwarded them to the President.

This program sets as a major objective the enrichment of the daily life of students and Faculty through progressive improvement of the lighting, color scheme, and decoration of the corridors most used and through substantial expansion of the present small-scale but successful program of temporary exhibitions. To accomplish these ends, the administration has assigned to the Director of Libraries jurisdiction over the key public spaces and has increased the budget for temporary exhibitions by a substantial amount. The Director of Libraries has appointed Herbert L. Beckwith, '26, Associate Professor of Architectural Design, to plan the exhibitions.

The entire program has included a thorough study of all the Institute public spaces now existing or likely to exist in the near future. It envisages, as occasion permits, the acquisition of permanent collections of distinction comparable to those of the Nautical Museum and the Dard Hunter Paper Museum, subject to the qualifications that they bear a clear relation to the general activities of the Institute and that they shall be displayed in special areas such as those now occupied by the Nautical and Hunter museums. No such addition is, however, immediately in prospect.

It is recognized in the report of the Director of Libraries that certain types of exhibition which are valuable for internal pedagogical purposes are not of public interest and would not be attractive even in those public spaces most frequently used. The program therefore suggests an encouragement of departmental pedagogical exhibitions but some distinction in their location as compared with those of general public interest.

* Members of the Committee for 1944–1945 were Victor M. Cutter, chairman, Charles G. Abbot, '94, Walter J. Beadle, '17, Robert P. Shaw, '23, Allan Forbes, Alfred V. Kidder, and Albert H. Wiggin.



Official U.S.A.A.F. photo

General of the Army H. H. Arnold presenting the Distinguished Service Medal to Edward L. Bowles, '22, expert consultant to the Secretary of War

For Distinguished Service

AT ceremonies in the Pentagon Building in Washington on November 13 the Distinguished Service Medal was awarded by General of the Army H. H. Arnold, Commanding, Army Air Forces, to Edward L. Bowles, '22, Professor of Electrical Communications at the Institute, who since April 6, 1942, has been on leave of absence for service as expert consultant to the Secretary of War. During the period from September 2, 1943, to September 2, 1945, Professor Bowles served also as consultant on communications to the commanding general of the Army Air Forces.

The citation accompanying the award recounts that in this latter capacity Professor Bowles "was responsible for over-all supervision in connection with all matters of communication, radar, countermeasures, radar aids to fire-control and bombing, radio and radar aids to navigation, and related electronic fields. Early recognizing that only by the exploitation of communications scientific resources would the Army Air Forces gain its required mobility, safety, and dispatch and that only by the combined efforts of science, industry, and military could radar be developed to its full potential in the finding of targets and their destruction, Dr. Bowles conceived and organized an advisory group composed of select electronics specialists to advise on these highly technical problems. He also secured the aid of leaders in scientific and industrial laboratories throughout the country and made their invaluable assistance available in the solution of special problems confronting the Army Air Forces. He was successful in placing scientific personnel on the staffs of all major A.A.F. commands to assist in the introduction and development of radar to its full application in the uses of modern Air warfare. By his clarity of vision, by his ability to interpret scientific principle into its practical application in military tactics, by his effective organizational talent, Dr. Bowles has made a material contribution to the combination of science and skill resulting in the world's greatest Air Force and the destruction of the enemies of democracy."

Professor Bowles's appointment as expert consultant by Secretary of War Henry L. Stimson, in which post he is continuing to serve Secretary Patterson, grew logically out of responsibilities which he had carried in the development of electronics prior to the war emergency. Long interested in enlisting the co-operation of the industry in connection with Technology's own educational and research programs, he had fostered co-operation of the Army, Navy, and Civil Aeronautics Authority in the Institute's fog-dissipation program; the C.A.A. on instrument landing of aircraft; the General Radio Company on high-frequency measurements; the International Telephone and Telegraph Company on ultrahigh-frequency measurements and dielectric studies; the Sperry Gyroscope Company on short-wave antenna research; and the Loomis Laboratory on wave propagation and other ultra-high-frequency projects.

As director of the Institute's fog-dissipation and short-wave radio program at Round Hill, Professor Bowles initiated projects which he continued to administer as director of the Institute's program of instrument landing of aircraft, conducted under the sponsorship of the C.A.A. Having taken the lead in the inauguration of Technology's extensive investigation of microwaves, he served as a charter member of the section on microwaves of the National Defense Research Committee for some two years before assuming his post as consultant to the Secretary of War. This appointment brought him responsibility in establishing policy and implementing plans for the Army in a variety of technical fields, including radar and communications. His parallel responsibility as consultant to the commander of the Army Air Forces carried authority to act for him in all matters relating to communications and radar, and it was subsequently broadened to include advising and assisting the commanding general on special technical plans and technical phases of plans. In January, 1945, on nomination of the Secretary of War, Professor Bowles was appointed an Army member of the National Academy of Sciences and the National Research Council Board for National Security.

A native of Westphalia, Mo., Professor Bowles attended Washington University in St. Louis, receiving the degree of bachelor of science in 1920. Graduate study at the

Institute followed, leading to the master's degree in 1922. In 1945 he received the honorary degree of doctor of science from Norwich University. Joining the staff of the Institute's Department of Electrical Engineering in 1920, he advanced to the rank of full professor in 1937. A fellow of the American Academy of Arts and Sciences, the American Institute of Electrical Engineers, the American Physical Society, and the American Association for the Advancement of Science, Professor Bowles is a senior member of the Institute of Radio Engineers, a member of the Society for the Promotion of Engineering Education, and a member of Sigma Xi. He holds numerous patents, has been active as a consultant in patent matters, and is a charter member of the Institute's patent committee.

Honors for De Florez

LUIS DE FLOREZ, '11, assistant chief of the Navy's Office of Research and Inventions, is one of a group of Reserve officers whose wartime contribution to the Navy has brought promotion to the rank of rear admiral.

Engineer, inventor, and naval aviator, Admiral de Florez reported for active duty in the Navy Department on August 12, 1940, and immediately became convinced that revolutionary methods must be devised to instruct flight crews in the use of new weapons of warfare. He began to develop devices for what has become known as synthetic training. The activity he launched became the Special Devices Division of the Bureau of Aeronautics. As head of this division, he supervised production of large quantities of synthetic training devices for aviation, including gunnery, power plant, navigation, radio, radar, and maintenance, and for other Navy needs, including antisubmarine warfare and anti-Kamikaze attacks.

Involving an expenditure of more than $100,000,000, there were successfully completed some 400 devices, including equipment for the Army, the British, and the Allied nations. Since the Army had no counterpart for Special Devices, the division supplied the Air Corps with virtually all of its synthetic training equipment and carried out the research and engineering for the devices.

Admiral de Florez gave personal attention to the conception and development of nearly all of the devices produced by his organization. This personal interest was a natural outcome of his flying experience and technical knowledge of aircraft equipment.

When the Office of Research and Inventions was established on May 19 to guide Navy research activities, Secretary Forrestal selected Luis de Florez to be assistant chief of the new office. He works with Rear Admiral Harold G. Bowen, chief of research and inventions, in stimulating this important Navy service. The new office was created by merging the Naval Research Laboratory, the Special Devices Division of the Bureau of Aeronautics, the Office of Co-ordinator of Research and Development, and the Office of Patents and Inventions.

High honors came to Admiral de Florez previously during the course of the war when, for his contribution to the safe and rapid training of combat pilots and crews, he received in 1944 the Robert J. Collier Trophy, given annually by the National Aeronautics Association for the greatest achievement in American aviation. On May 17 he was awarded the Legion of Merit for exceptionally meritorious leadership of the Special Devices Division and for his development of special antisubmarine devices and weapons used to train submarine officers and crews for combat duty. On November 6 he was awarded the Distinguished Service Medal for "exceptionally meritorious service to the Government of the United States in a duty of great responsibility as Director of the Special Devices Division of the Bureau of Aeronautics and as Assistant Chief of Research and Inventions, Navy Department."

Alumni Day 1946

CONTINUING the tradition of co-ordinating Alumni reunions with commencement exercises, Alumni Day 1946 will be held on Saturday, February 23, and, as has been customary for many years will consist of two events — Class Day exercises and the popular Stein-on-the-Table Banquet. The Class Day exercises will be held at Walker Memorial at 2:30 P.M.; at 7:00 P.M. that evening the Hotel Statler will be the scene of the banquet, with members of the graduating class as guests.



Official U. S. Navy photograph

Luis de Florez, '11, receiving the Distinguished Service Medal from Artemus L. Gates, as Under Secretary of the Navy

Preparations for this event are in the hands of the Alumni Day Committee of which Larcom Randall, '21, is chairman. Serving as chairmen of subcommittees are: John D. Mitsch, '20, *Class Day;* Frank R. Shaw, '24, *Dinner;* Mrs. Leicester F. Hamilton, *Ladies;* Ralph T. Jope, '28, *Publicity;* Donald P. Severance, '38, *Registration;* and Horace S. Ford, *Ways and Means.*

It is anticipated that these will be the last Class Day exercises to be held under the Institute's accelerated schedule of war training, for transition to normal peacetime activities is well under way, as is evidenced by the plans now being made for an Alumni Victory Reunion celebration to be held in the Great Court of the Institute in June.

Appointment

RICHARD TAYLOR, '34, has recently been appointed assistant professor of electrical engineering and began his new duties on November 1. Professor Taylor received his bachelor of science degree from the Department of Electrical Engineering in 1934 and the master's degree from the same Department in 1937. In October, 1934, he was appointed research assistant in that Department and in July, 1941, was advanced to research associate.

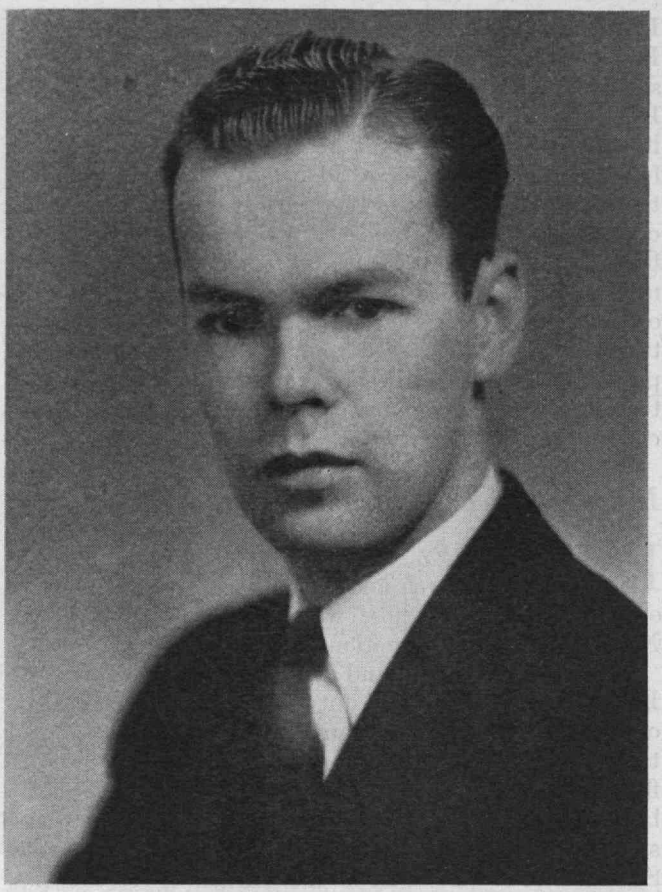
Since he was originally appointed to the staff of the Department of Electrical Engineering, Professor Taylor has been associated with work on the differential analyzer and has made many notable contributions to the development of the new machine, which was described in the November issue of The Review. During the war he supervised a Navy project for the Bureau of Ordnance as well as a number of other research projects employing the differential analyzer.

Born on April 13, 1912, Mr. Taylor is the son of Mr. and Mrs. Samuel R. Taylor of Great Neck, Long Island. In 1943 he married Miss Margery Poole of Hanover, N. H., a graduate of Radcliffe College and formerly a research assistant in the Sanitary Engineering Department at Harvard University.

Microwave Publications

PUBLICATION of the largest series of books on physics and electrical engineering ever undertaken in the United States has been arranged by M.I.T. for the Office of Scientific Research and Development, it was announced early in December by James R. Killian, Jr., '26, Vice-president of the Institute. The Radiation Laboratory Technical Series, comprising 28 titles and a general index, reports the results of five years' wartime work on radar. The purpose of the series is to make available to science, industry, and the public generally the results of the immense developments in electronics and in microwave theory and technique during the war years, which, once secret, have now been widely declassified. The books will be of inestimable value in peacetime research in physics, biology, and other natural sciences as well as in providing the engineering foundation for postwar industrial developments in television, communications, and electronics.

Work reported in the series required the expenditure of about 20,000 technical man years in the various radar research and development establishments, Dr. Killian revealed. "For the first time," he said, "the technical literature of a large subject is being created all at once, on a uniform basis. . . . Emphasis in the series will not be on radar itself but rather on the basic techniques which underlie many phases of electronics in addition to radar."

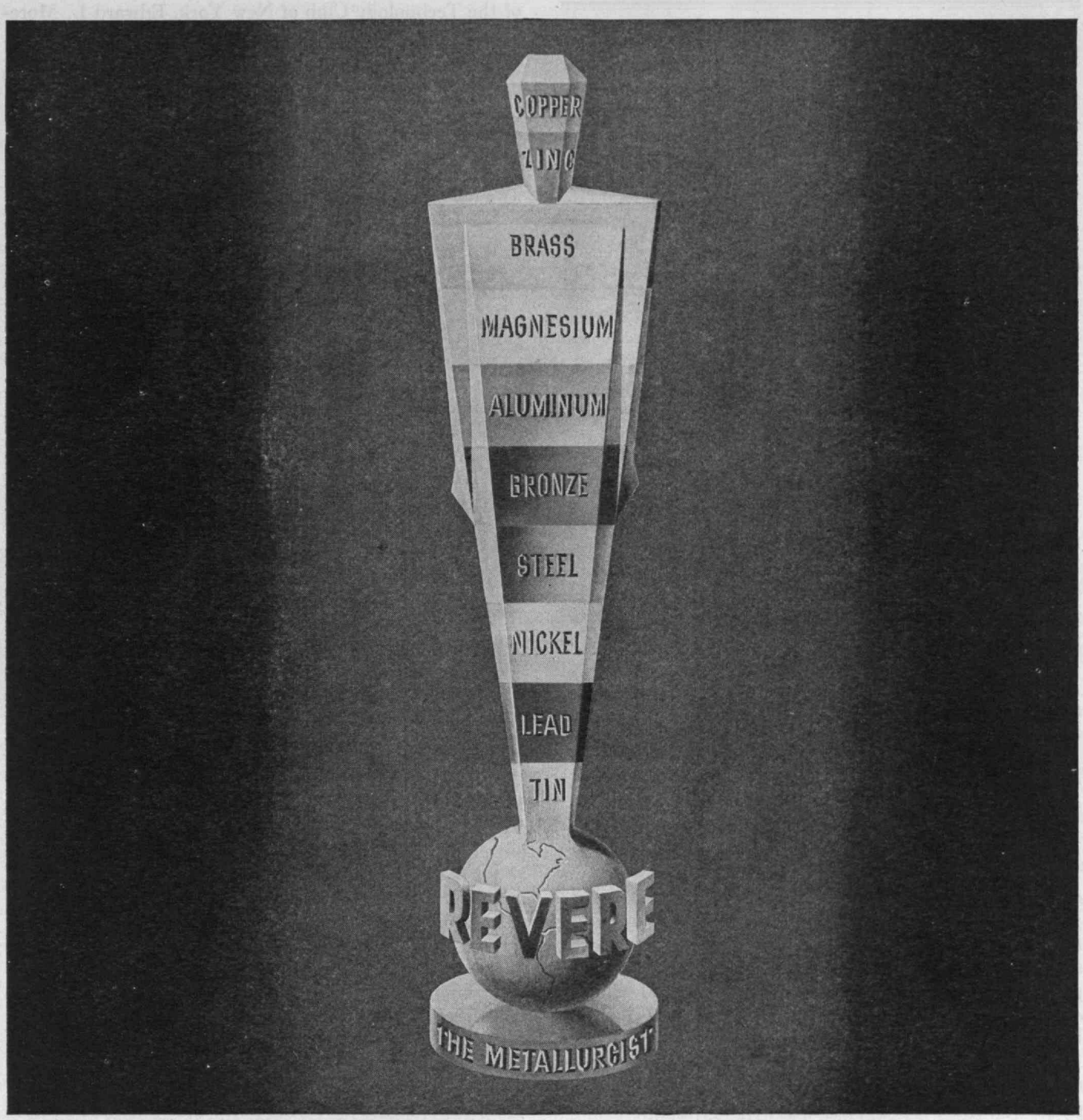


Richard Taylor, '34, recently appointed Assistant Professor of Electrical Engineering

Publication of the series will be handled by an agreement between the Institute, acting for the Office of Scientific Research and Development, and the McGraw-Hill Book Company, which is undertaking the publication. This arrangement is expected to serve as a model for the publication of other scientific work done with public funds under O.S.R.D. contract, now that the need for wartime secrecy no longer exists, where this information is of general interest and can desirably appear in book form.

Plans for the series have been under way since late 1944 when it became clear that the end of the war was not far distant, and intensive work has been carried on since June. Manuscript is now being prepared at the rate of nearly 400 pages a day by 187 authors under the direction of nine editors. Illustrations are being drawn by more than a hundred artists and draftsmen.

Books of the series are being written chiefly by staff members of the Radiation Laboratory but will include the results of work on radar done in British development establishments and in industrial laboratories both here and in England. Several British scientists have come to the Institute to co-operate in the preparation of the series. Summaries of the scope and contents of the books show that several fields of the greatest scientific and engineering importance will be covered. (*Concluded on page 178*)



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THE INSTITUTE GAZETTE

(*Concluded from page 176*)

In addition to this large group of textbooks coming from research activities at the Radiation Laboratory, the Institute's war-training program has provided material for another volume on microwave techniques. This publication, *Principles of Radar*, was prepared by a group of instructors at the Institute's Radar School and was used during the war as a classified textbook to train Army and Navy officers in the theory and operation of radar systems. The caliber of this volume may be inferred when it is recognized that the Institute has granted credit for some of the courses in which it was used as a textbook. Under present publication plans, *Principles of Radar* will soon be made available for general use by the McGraw-Hill Book Company. Royalties from the sale of all volumes will be paid to the United States Treasury.

Mélange

THE 247th meeting of the Alumni Council was held in Pritchett Hall of Walker Memorial on November 26 with President A. Warren Norton, '21, presiding. Attendance records show that 97 members and guests were present at a meeting which dealt with a wide variety of Institute and Alumni affairs.

Opening the business portion of the meeting was the announcement of the election of the following Faculty members as staff members of the Alumni Association: Lawrence J. Heidt, Assistant Professor of Chemistry; John M. Lessells, Associate Professor of Mechanical Engineering; Wayne B. Nottingham, Professor of Physics, Lybrand P. Smith, visiting Professor of Naval Engineering; Gerald B. Tallman, Assistant Professor of Marketing; William H. Timbie, Professor of Electrical Engineering and Industrial Practice; and Morris Zeif, research associate in the Department of Chemistry. At the same time, a number of new committee appointments were announced, and membership on certain other committees was expanded. A report on the Alumni Day activities held on June 23 was submitted by Josiah D. Crosby, '21, Alumni Day chairman, and was unanimously accepted.

As chairman of a special Committee on Boston Technology Club, George Warren Smith, '26, presented a report for his committee. Although there was evidenced a need for a Technology club in the Boston area, the committee proceeded to examine carefully all possibilities. Desirable as it might be, the committee felt that a club in Boston with its own building was too ambitious a matter to undertake, particularly at the present time with the shortage of housing accommodations. Other plans for bringing together Alumni in the Boston area were examined. The most promising method of promoting better acquaintance among Alumni members in this district appeared to be that of holding regular luncheon meetings with groups of reasonable size. It is planned to put this proposal into effect as soon as the present overcrowded dining facilities make such a program feasible.

Following the several committee reports were talks by Norman N. Holland, 2–47, chairman of the student budget committee, James R. Killian, Jr., '26, Vice-president of the Institute, John H. Teeter, '22, representative of the Technology Club of New York, Edward L. Moreland, '07, Dean of Engineering, and Nathaniel McL. Sage, '13, Director of the Division of Industrial Cooperation and Placement Officer.

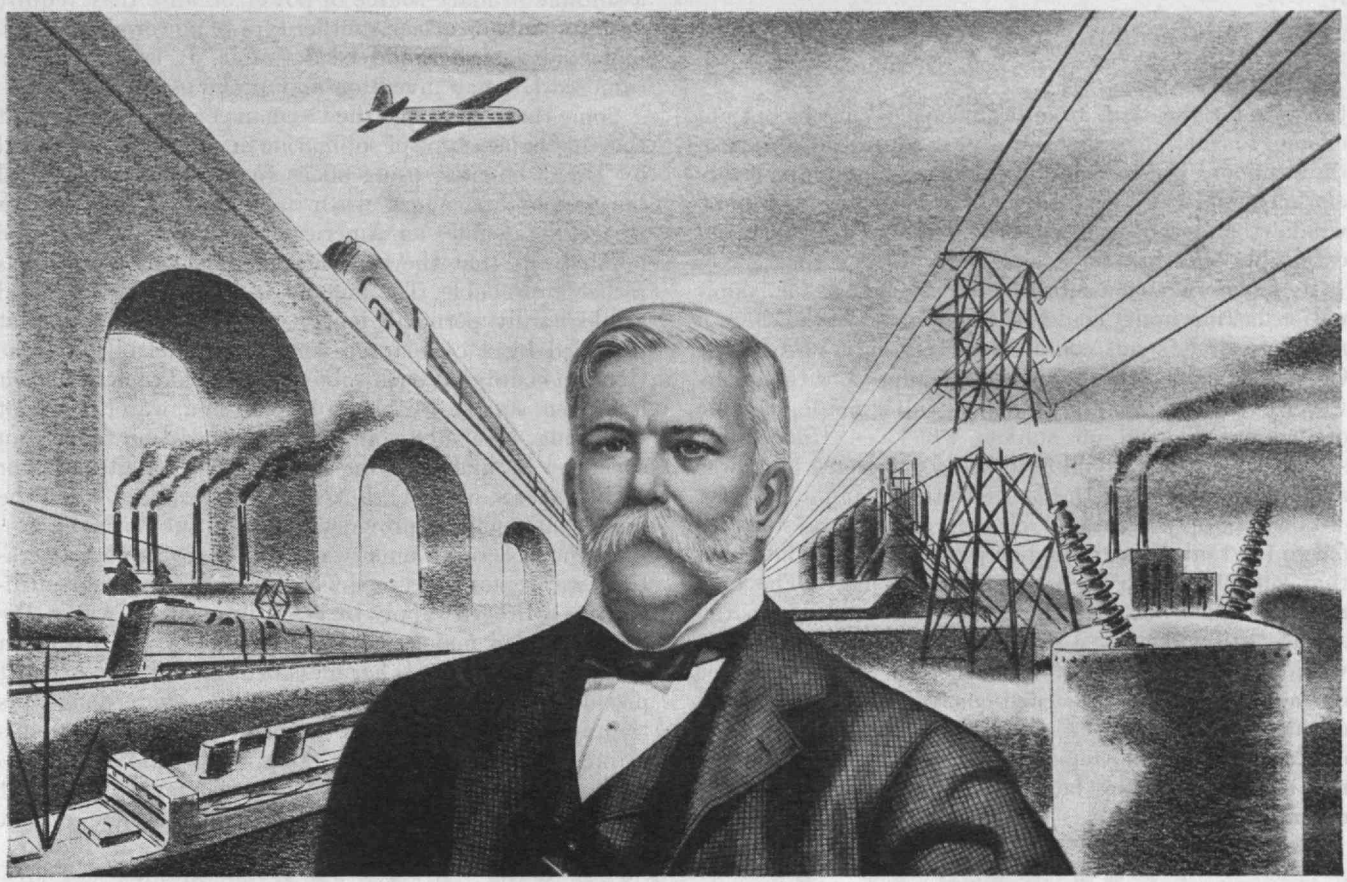
As chairman of the student budget committee Mr. Holland made a fine presentation of the problems that are being encountered and successfully solved in connection with the reconversion of student activities from a war- to a peacetime basis.

Dr. Killian outlined a number of highly important recent developments at the Institute and announced that war research projects had passed their peak and were rapidly tapering off to a peacetime basis in conformity with the gradual return to normal of the operation of the Institute. Applications for enrollment are being received from very many more prospective students than the Institute can accommodate even after expanding its normal enrollment by about 50 per cent. There will be a real problem in obtaining an adequate teaching staff, laboratory facilities, and living quarters for the enlarged student body which is expected to return to the Institute, but progress is being made toward the solution of all such problems. Careful consideration is being given to the need for a new dormitory, a new gymnasium, a new library, and a new metal-processing laboratory. The Westgate housing project (discussed on page 45 of The Review for November) is expected to be completed by January 1 and will provide housing for 100 married students.

Mr. Teeter made an appeal that the council interest itself in the legislation pending before Congress which deals with the peacetime organization of scientists and the establishment of a national research foundation. Of the two bills most likely to be passed, the Magnuson Bill is favored as being preferable to the Kilgore Bill by Vannevar Bush, '16, head of the Office of Scientific Research and Development, and other scientists.

An unusually interesting address was given by Dean Moreland, who recounted his very recent experiences in Manila and Japan. In a flight over Hiroshima at an altitude of less than 300 feet he had an excellent opportunity to observe the effects of the explosion of the atomic bomb. Everything within a radius of about a mile from the center of the blast was completely destroyed, and for another mile destruction was almost complete. Examination of the second bomb explosion at Nagasaki showed damaging effects in a village four miles from the center of the blast. Dean Moreland stressed the point that scientific observers at these two places had definitely demonstrated that there was not the slightest degree of residual contamination from the atomic bomb.

As final speaker of the evening Mr. Sage discussed the business aspects of the Institute's war research contracts and acquainted his audience with some of the problems which the Institute had faced in its negotiations with the government for research activities during the war. While all contracts were established on the basis that the Institute should neither gain nor lose financially, it was exceedingly difficult to put this theory into practice, particularly since no standard contracts had been established. In many cases the contracts originated at the Institute were used as a guide in the government's dealings with other educational institutions on war projects. Hope was expressed that a standard contract could be developed as a result of experience gained during the war.



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FORTUNES—TWENTY FATHOMS DOWN

(*Concluded from page 166*)

traction for the tank to crawl against a current but not enough to cause it to sink into soft mud on the surface of the sea floor. The men inside could wear ordinary heavy clothing, and they would be able to see through small windows and tank periscopes and might even have an extensible telescope for a look beyond the surface.

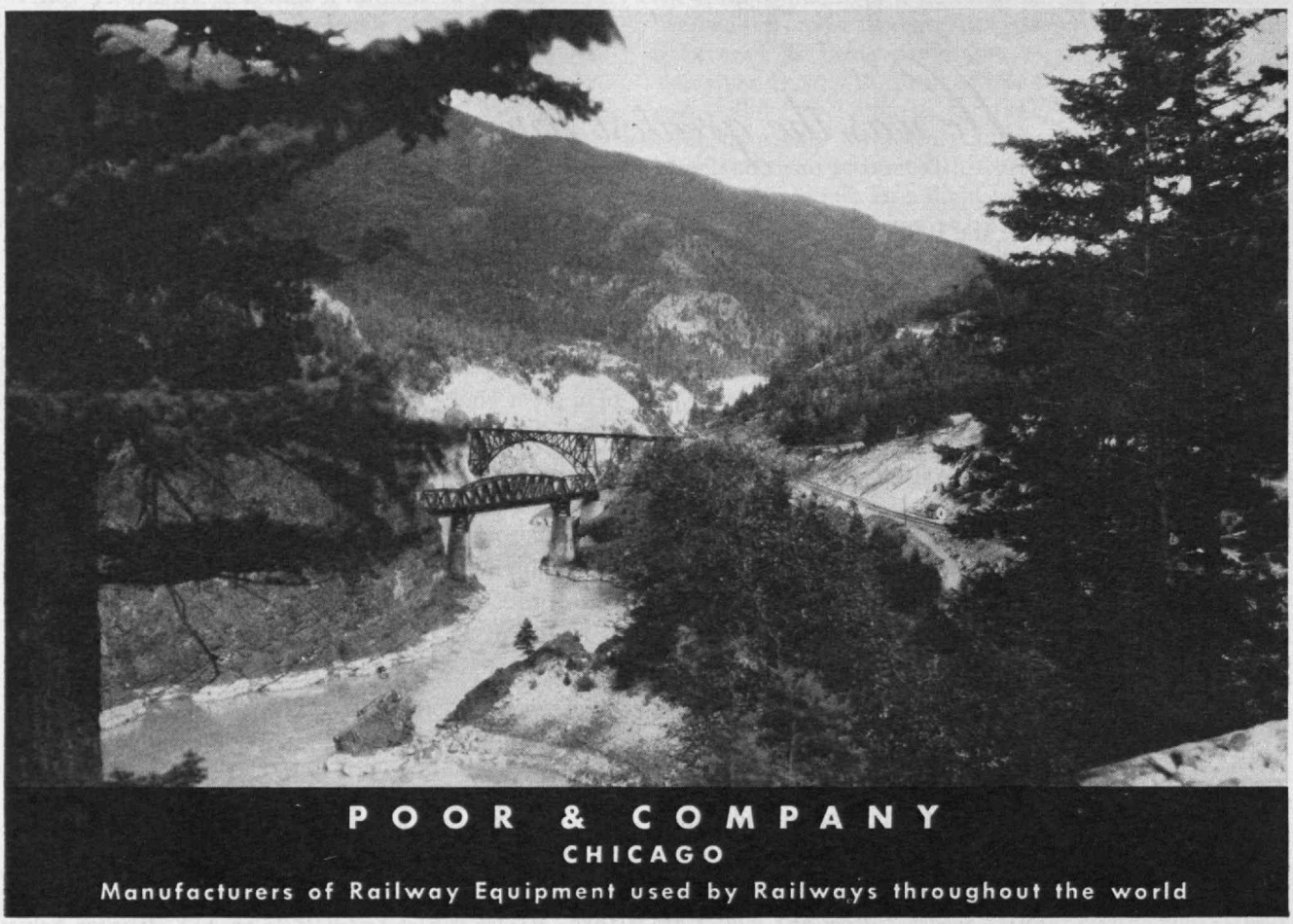
By means of such a submersible vessel a careful examination lasting hours could be made at a depth where a man in a diver's suit could remain for only 10 minutes. Of course, such a tank could be equipped with underwater cutters, power tongs, and a water nozzle, capable of "blowing" sand off sunken wreckage. Underwater salvage operations would then be accomplished by power machinery instead of the less effective manual activity.

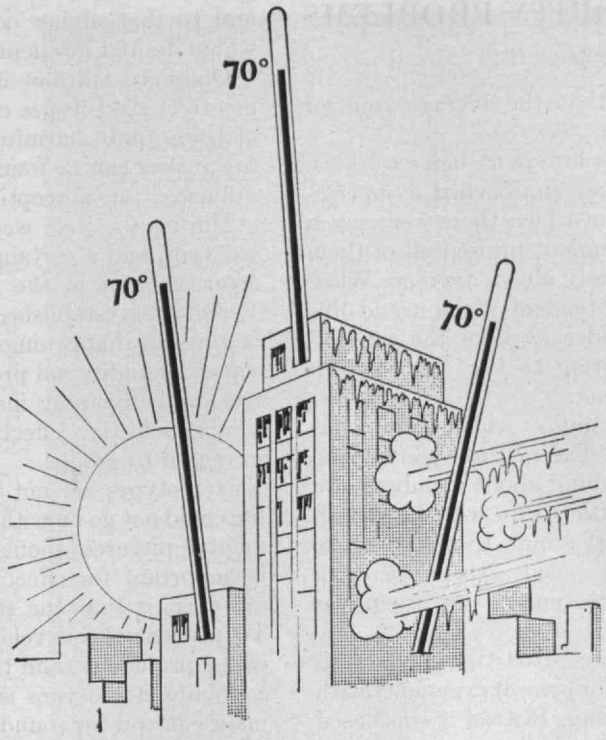
Power supply would be electric current, presumably fed to the tank by a trailing cable since it is not intended that such tanks be used too far from shore. The best method might be to send the cable straight up to the surface to be held by a number of floating buoys. This would prevent fouling the power cable on underwater obstacles. The current needed could be generated in the engine room of a ship accompanying the tank. In that case, the ship would remain as nearly as possible above the tank, unless the latter were engaged in blasting operations.

Naturally a tank which is independent of either a shore-based power plant or a ship's generator would be even more advantageous. Storage batteries would not provide a suitable primary source of power because they require vast amounts of space. Another type of power plant for an underwater tank would be desirable. It is here that a rumored German invention may prove useful.

Some three years ago the Germans began to claim that they had a new type of submarine in operation, propelled by Diesel engines, using oil as fuel on the surface and burning hydrogen gas when submerged. While this is perfectly possible, an American submarine expert soon pointed out that the existence of such submarines was rather improbable. The amount of hydrogen gas carried would hardly permit a longer cruising range than that provided by a comparable amount of fuel oil, and the German claim that such submarines could replenish their hydrogen supply by electrolysis of sea water was not promising. Not only would such an operation require an exchange of hydrogen for fuel oil (with a rather poor exchange rate at that), but the space required would be more than could be provided aboard a submarine.

In the case of an underwater vessel for salvage operations we are not concerned with the question of replenishing the hydrogen supply by electrolysis of sea water. We are concerned mainly with the possibility of carrying a powerful fuel which is harmless in itself and the exhaust products from which consist of nothing more dangerous than water vapor. The type of engine which the Germans claimed to have developed — and possibly did develop — for submarines could be used for such tanks. And that would mean the beginning of an entirely new era in underwater salvage and construction work.





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RESEARCH ON MINORITY PROBLEMS

(*Continued from page 164*)

was either equal to or better than the average younger worker.

The logical conclusion was to hire more older workers. With that in mind, the manager approached a superintendent in charge of a section in which there were seven workers over 30. The superintendent praised all of them as good or excellent and definitely above average. When the manager asked the superintendent if she would like to have a few more of these older workers, the superintendent strongly refused, pointing to the "well-known fact that old workers are no good."

This is only one of many examples which show what at first may seem paradoxical. The picture (stereotype) which an individual has in his mind about members of a social group may have very little to do with his actual experience with members of that group. In our case, the superintendent had had only good experience with workers over 30. Still her stereotype of this group was definitely negative.

We should notice that action in regard to the group (such as hiring) was not based on past or present experience with individuals belonging to the group. Instead it was based on a stereotype. This stereotype was the same as the one in the mind of the colleagues of the superintendent, although neither stereotype was in line with experience.

This example is particularly impressive because the prejudice (incorrect stereotype) against the old worker was quite harmful to the interest of the superintendent and to that of her colleagues in management, each of whom desired her department to be efficient.

One may ask how it is possible that even in industry incorrect stereotypes can be kept up for decades in spite of being quite harmful to production. In part, at least, the answer can be found in the peculiar way a stereotype influences our perception.

During the first weeks at the factory a newcomer is sized up, and a certain picture of his abilities and character emerges in the mind of the employer. Once the stereotype is established, it is frequently difficult to change, because any happenings in line with the stereotype are perceived as additional proof that the mental picture is correct, and diverging instances are seen as exceptions. A similar selective effect of stereotypes can be observed in regard to groups.

Stereotypes are not bad in themselves. In fact, social life could not go on without every individual's having some mental pictures about other persons or groups. What is important for effective and well-organized social life, however, is that the stereotype be in line with reality. To prevent the development of wrong stereotypes, so-called prejudices, and to bring about the development of adequate stereotypes is very important for personal adjustment and for sound group life.

At present we do not know too much about the exact nature of the process by which correct or incorrect stereotypes develop. We do know, however, that no one is born with prejudices. The emotionality behind many of our prejudices gives them an intensity which makes them ap-

(*Continued on page 184*)



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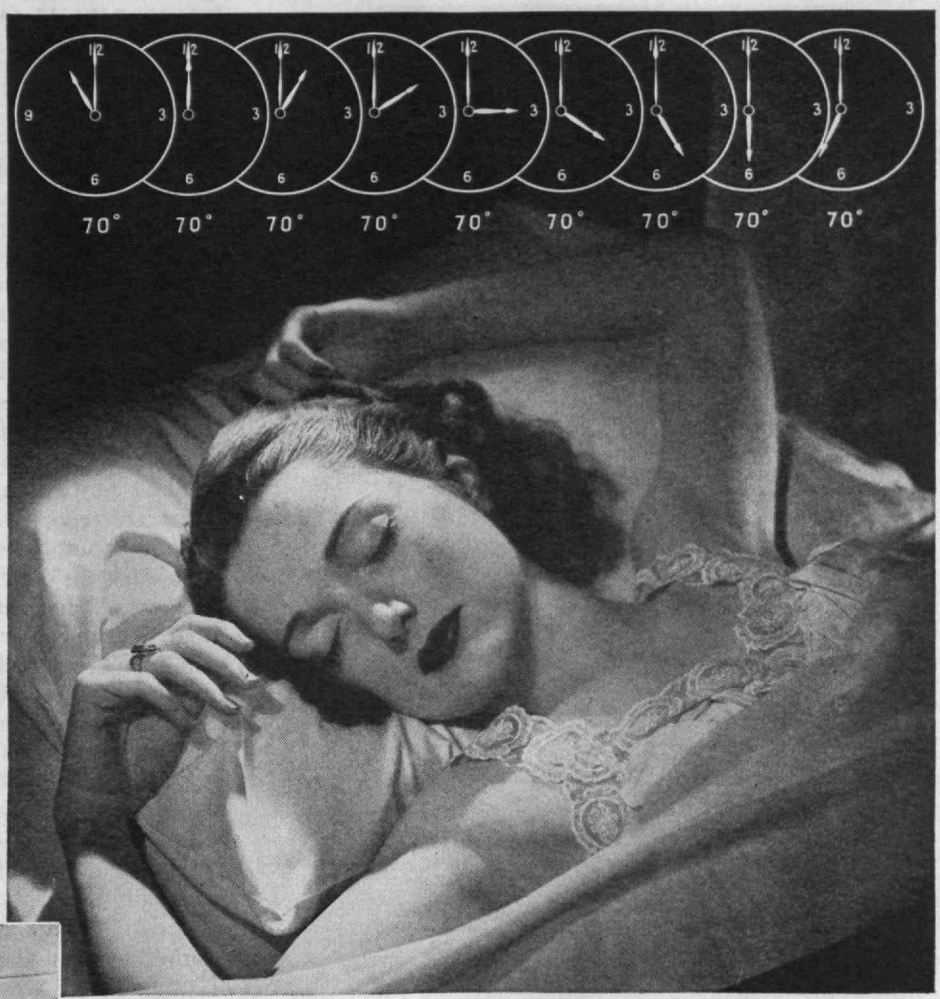
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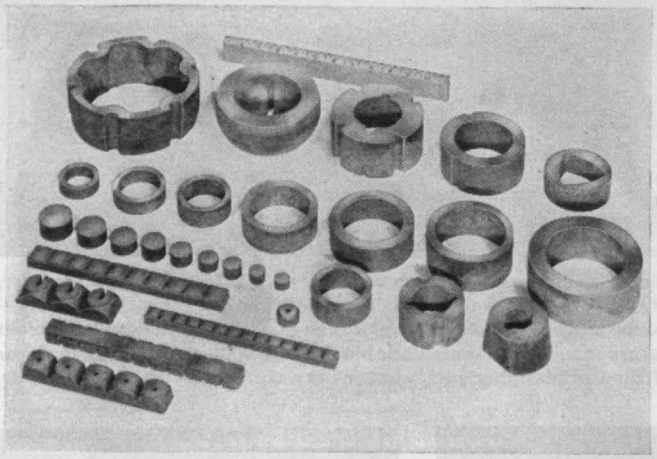
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RESEARCH ON MINORITY PROBLEMS

(*Continued from page 182*)

pear to be natural or inherited. Actually, the child acquires his correct or incorrect stereotypes as he grows into the culture which dominates his society of children and adults.

To a high degree this culture determines those factors to which the growing child pays attention and how he evaluates people and events. A schoolteacher in Philadelphia recently told of a white child's asking his mother whether he could bring his school friend, Johnnie, home with him. When his mother inquired whether Johnnie was white or colored, her son answered, "I don't know, Mother, but I will look tomorrow." We do not expect such lack of attention to socially important characteristics in an older boy in the American scene, although similar stories are reported in regard to adults in Brazil. There are quite a number of men who would not know the color of their friends' hair. If no cultural factors were involved, the laws of physical perception would probably lead to about the same degree of attention to skin color. Negroes with light skin who look down on Negroes with dark skin are likely to be more aware of the exact color shade than are white people. Anti-Semites are better able to pick out Jews on the basis of appearance than can those who are not anti-Semites.[4]

The observation on grown-ups in industry has its parallel in genetic studies. We know that the degree of anti-Negro prejudices of school children, for example, has practically no relation to the amount of personal experience with Negroes. Such facts as a colored boy's being the admired football player seem not to influence the amount of prejudice of the white members of his school. The school children in a small midwestern town which had no Negro inhabitants nevertheless showed considerable prejudice against this group.[5] Some of the younger of these children did not know "what a Negro was like." In other words, they did not have a stereotype concerning Negroes, aside from the idea that they were something negative. Only later when a stereotype develops, when the Negro becomes identified, for instance, with someone "easygoing, artistic, and unreliable," is the child able to give reasons for his dislike. When asked how he knows that Negroes have these characteristics, the child frequently says, "Look around," even though he is growing up in a town without Negroes.

(*Continued on page 186*)

[4] Bernard Cramer, a study directed by Professor Gordon Allport of Harvard University, to be published soon.

[5] Marian Radke, from an unpublished study, "Children's Attitudes Toward Minority Groups."



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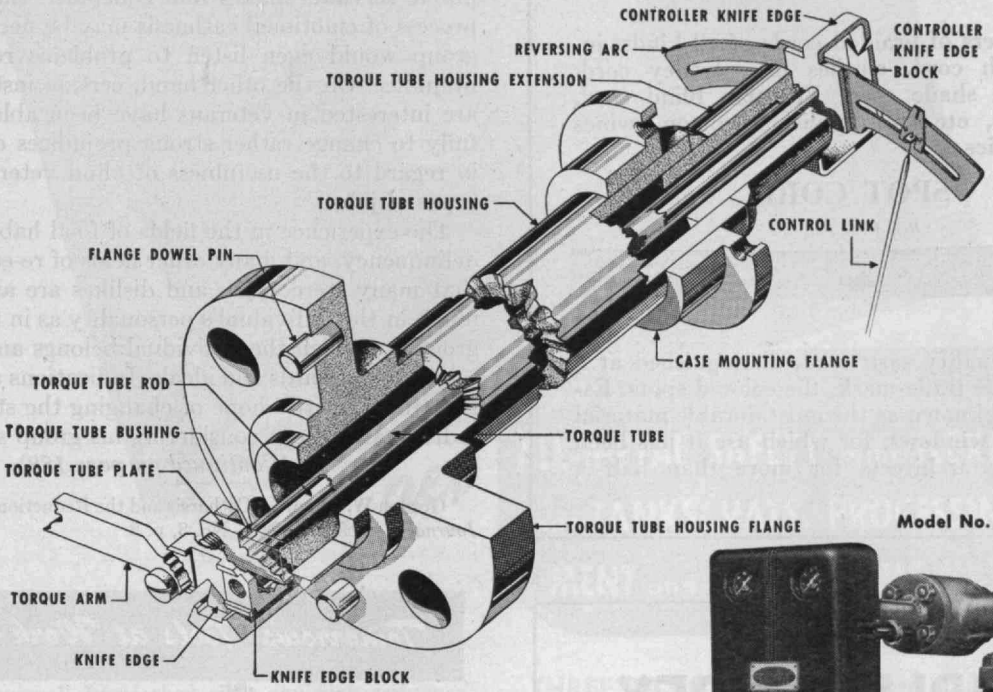
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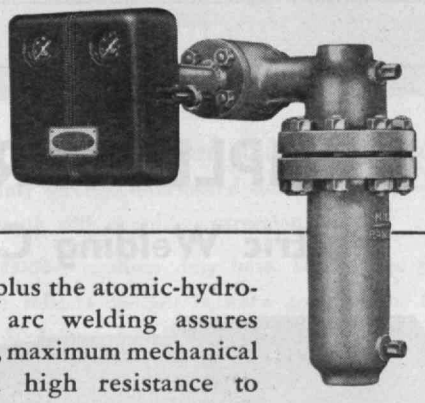
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RESEARCH ON MINORITY PROBLEMS

(*Continued from page 184*)

The fact that the reasons, or more correctly the rationalizations, for prejudices may well develop after the emotional attitude has been firmly established explains why in all fields of prejudice the same person frequently gives a multitude of self-contradictory reasons without awareness of his lack of logic. It also makes it understandable why prejudices are so difficult to change by rational means.

Stereotypes frequently have extreme resistance to change. Professor Allport's experience with a group of public servants makes him conclude [6] that an extended process of emotional catharsis may be necessary before a group would even listen to problems related to their prejudice. On the other hand, certain institutions which are interested in veterans have been able very successfully to change rather strong prejudices of management in regard to the usefulness of blind veterans for certain types of jobs.

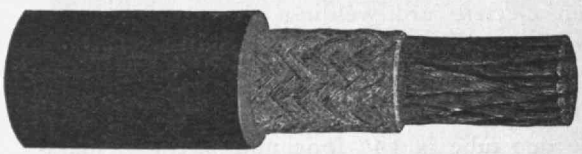
The experience in the fields of food habits, alcoholism, delinquency, and many other fields of re-education shows that many stereotypes and dislikes are anchored not so much in the individual's personality as in the face-to-face groups to which the individual belongs and which determine his standards and ideals. Indications are multiplying that there is little hope of changing the stereotype of an individual without considering his group standards. For-

(*Continued on page 188*)

[6] Gordon W. Allport, "Catharsis and the Reduction of Prejudice," *The Journal of Social Issues*, I, No. 3, p. 3.

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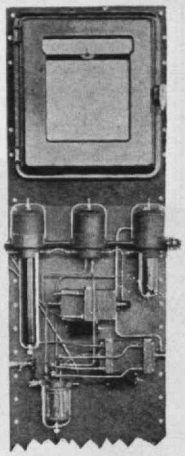


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RESEARCH ON MINORITY PROBLEMS

(*Continued from page 186*)

tunately, experience in the field of foreman training, delinquency, and alcoholism indicate that changing the opinion and conduct of a face-to-face group is not necessarily more difficult than changing the conduct of a single individual. In fact, group therapy, as used in psychiatry, is based on the idea that under certain circumstances changing the opinions or the conduct of groups is more readily accomplished than the corresponding changes in individuals. Group re-education in many fields is developing rapidly and will do much to give us a deeper insight into many factors of group life.

Of course, there are many aspects of group life, aside from the problem of stereotypes, which have to be considered for changing group relations. It is hardly necessary to mention housing, health, vested interests, and all types of economic and other opportunities. In the past, research on these questions usually has meant broad surveys; the concepts used have been mainly such abstract categories as economics and law. These have been the bases for housing projects and legislation as well as for good-will meetings.

There are many indications that the usual form of good-will meetings has much less effect on actual group relations than the sponsors would believe. Frequently they merely heighten the bad conscience which results from the discrepancy between what is accepted as official philosophy and what is practiced in everyday life. Myrdal [7] emphasizes the amount of tension and the difficult position in which this bad conscience places the majority group. Countless committees have sprung up all over the country: mayors' committees, citizens' committees, school programs, police training, and so forth. They testify to the urgency of the problem as well as to the great amount of good will in the country and readiness for action. Some organizations are emphasizing mainly the economic aspect, others place their hope in legislation. Here, as in other problems of group life, no artificial concentration on one aspect will suffice. Which particular aspect is most important for practical purposes will depend on the constellation at the given time and place and can be judged only on the basis of an unbiased overall approach.

Unfortunately, there are indications that many committees on minority problems do not see their way clear for action and that frustration may lead to dangerous disillusionment. We are urgently in need of a better understanding about exactly what a school or a mayors' committee or any other specific type of organization is able to do, what it cannot do, and how its function can be fulfilled most effectively. We need a realistic research program to find out what action will lead to what results under what conditions. Such a program would use surveys as background but would have to emphasize experiments in change and measurement of effects. It would have to consider both large and small units. It would have to find out, for instance, under what circumstances a club that is open to Negroes becomes all Negro and when it stays mixed. What is the effect of numbers, type of leadership, social atmosphere, composition of the man-

(*Concluded on page 190*)

[7] G. Myrdal, *American Dilemma; the Negro Problem and Modern Democracy* (New York: Harper and Brothers, 1944).

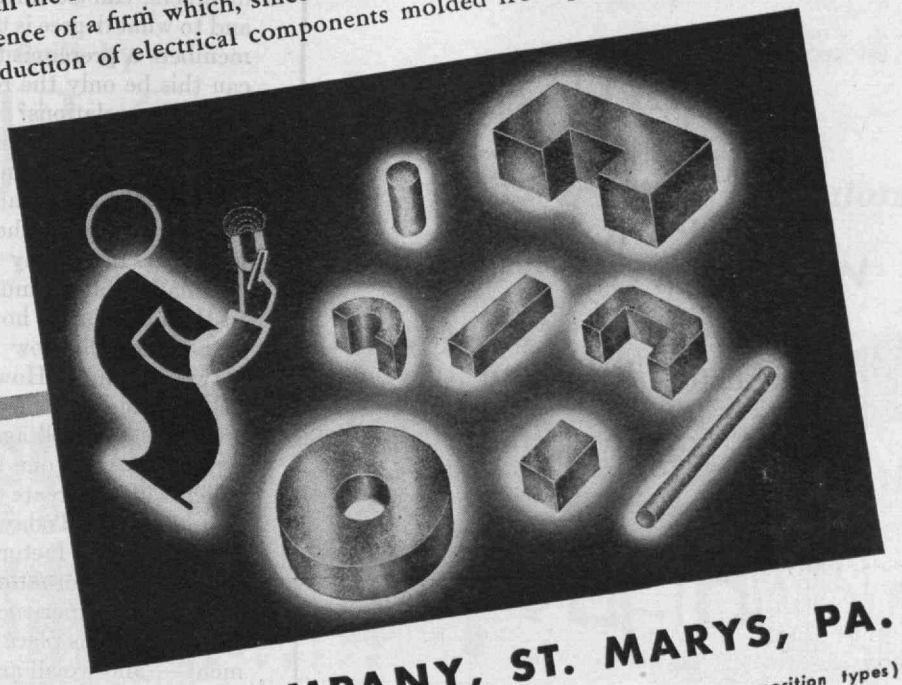
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RESEARCH ON MINORITY PROBLEMS

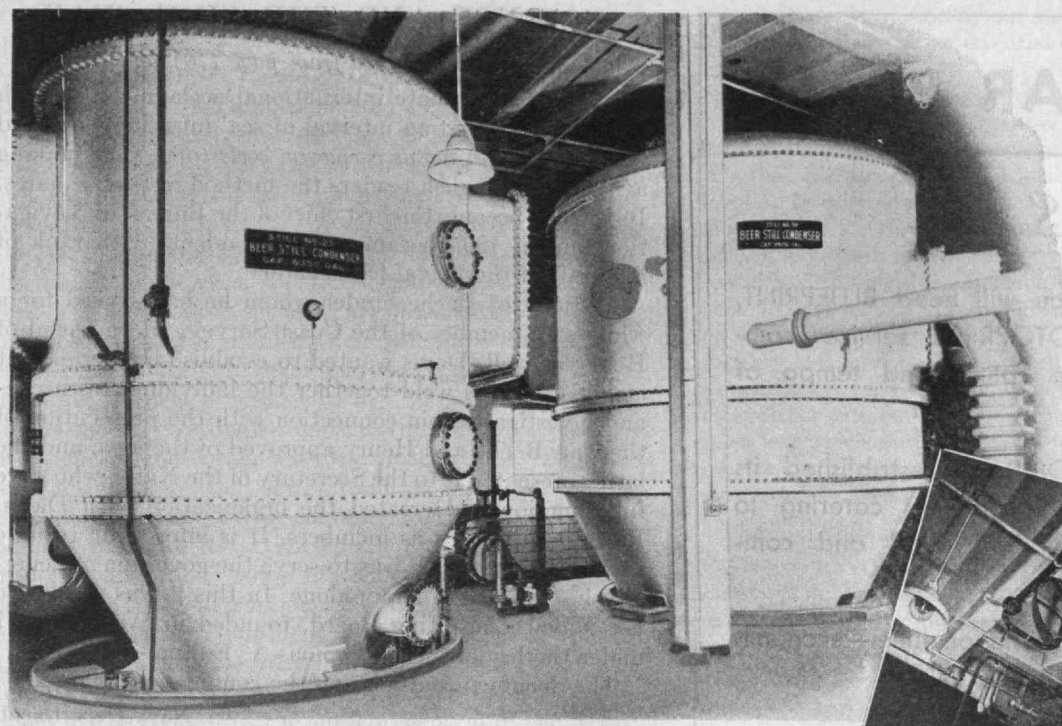
(*Concluded from page 188*)

agement of the center? The research would test, for example, which procedures of employing minority members increase, and which procedures decrease, group tension. In other words, this research would have to concern itself with the actual functioning of group life, not the least with the inner structure of the various minorities.

The life of an individual of a minority group is usually quite different from what it appears to be to the outsider. Far from being one united body, a minority is usually split into factions, fighting among one another. Internal group dissension is likely to be the more bitter the greater the pressure from the outside. Minority groups are likely to be led by what might be called "leaders from the periphery," that is, individuals from the minority group who have gained sufficiently in status and power. Unfortunately for the minority, the position of these individuals makes them relatively well accepted by the majority. This is likely to create a psychological attitude on the part of minority leaders which brings them to look down on their own group and to accept the philosophy of the majority to a degree which makes these leaders objectively enemies of their own group.

It seems to be not entirely outside the range of group research to find out whether and to what degree minority problems can be solved through methods dealing mainly with the individual, such as encouraging friendships and diminishing segregation, and to what degree are necessary methods which deal with groups as groups. We should like to know how the self-hate, which is so dominant in most minority groups and which is one of the most common sources of insecurity and maladjustment of minority members, can be minimized. Under what circumstances and to what degree is the raising of self-esteem of minority members a prerequisite for any improvement, and when can this be only the result of improved living conditions and group relations?

One of the most important practical aspects of group relations is closely linked with a question that is theoretically fundamental for all forms of group life: What forces determine the quasi-stationary equilibrium in which the life of any group proceeds, whether the group be a nation, a community, or a factory? A problem akin to the question of how to raise permanently production in a factory is how to improve permanently relations between groups. How can one avoid producing a mere "shot-in-the-arm effect," which makes production rise for a while only to fall again to the previous or even a lower level? How can one change a social situation in a way which will not create counterforces great enough to eliminate the gain? Today questions such as these have to be handled in the factory and in the community, on a national and international scale, with whatever practical wisdom and experience we may have to offer. The persons whose positions place on them the duty of social management — and we all are to some degree in this situation — are like engineers who have to set up and to maintain complicated machinery without the benefit of experimental physical science. Social management on all levels should benefit much from an experimental social science which could offer a clear scientific understanding of the dynamics of social living.



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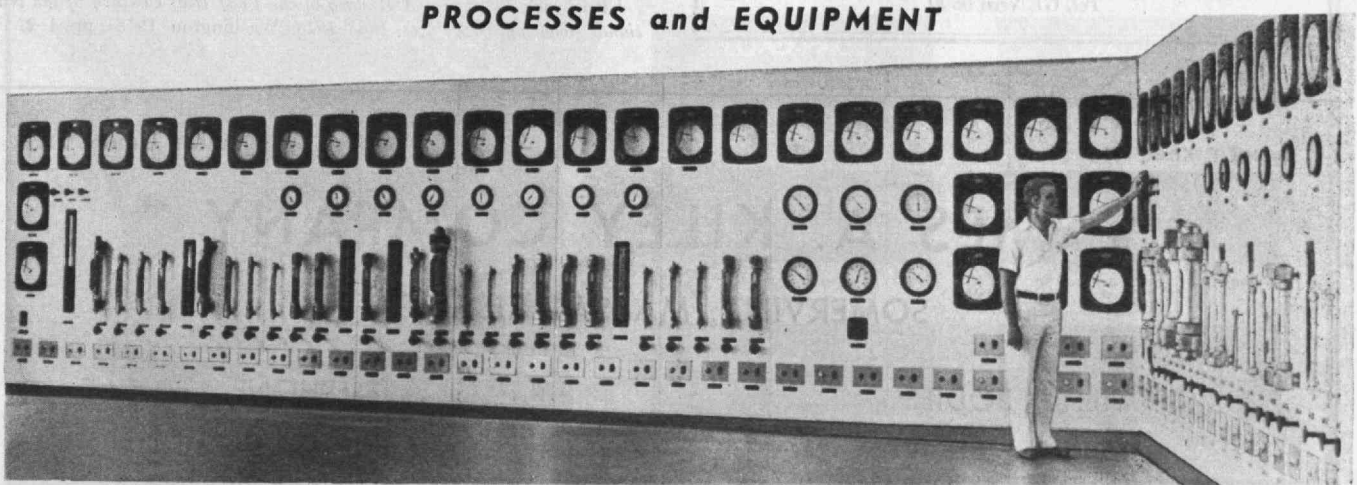
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SCIENCE AND THE CIVIL WAR

(*Continued from page 170*)

which won immediate international acclaim for its high standards. During an interval of sea duty, he translated Gauss's *Theoria motus corporum coelestium*, thus making available to English readers the method of least squares. In 1863 he became the first chief of the Bureau of Navigation and in 1865 became superintendent (with rank of admiral) of the Naval Observatory.

A friend of Bache, under whom he had served for a while as a member of the Coast Survey, and a friend of Henry as well, Davis wanted to establish a "permanent commission" to weld together the individual researches and investigations in connection with the prosecution of the war. Bache and Henry approved of the idea, and the latter presented it to the Secretary of the Navy, who gave full sanction and created the organization with Davis, Bache, and Henry as members. It is interesting to note that this commission was to serve the government generally instead of the Navy alone. In this it was similar to the Naval Consulting Board, founded in World War I under the leadership of Thomas A. Edison.

The document authorizing the commission follows:

Navy Department,
February 11, 1863.

Sir: The Department proposes to organize upon the following programme a permanent commission to which all subjects of a scientific character on which the Government may require information may be referred.

Propositions relative to a permanent scientific commission:

1st. There shall be constituted a permanent commission consisting of, for the present, Commodore Davis, Professor Henry, and Professor Bache, to which shall be referred questions of science and art upon which the Department may require information.

2d. This commission shall have authority to call in associates to aid in their investigations and inquiries.

3d. The members and associates of the Commission shall receive no compensation for their services.

You are directed to act as a member of the Commission in conjunction with Professor Henry and Professor Bache.

Such matters as are presented to the Department will be referred to you for examination and report by the Commission.

I am respectfully, etc.,

GIDEON WELLES,
Sec'y of Navy.

COMMODORE CHARLES H. DAVIS,
Chief of Bureau of Navigation.[5]

[5] Frederick W. True, *A History of the First Half-Century of the National Academy of Sciences, 1863–1913* (Washington, 1913), pp. 1–2.

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Once the commission was under way, Davis decided that the time was ripe for the formation of a National Academy of Sciences. Bache and Henry, both of whom had long advocated such a body, as had a distinguished list of American scientists and statesmen from the time of Jefferson, were not very optimistic about the possibility of a wartime Congress taking out time for such considerations. But, as it turned out, Davis was right, and the academy was incorporated in a bill which was passed without discussion on March 3, 1863, less than a month after the commission had been set up. Part of the academy's charter provided that it should, when called upon by the government, "investigate, examine, experiment, and report upon any subject of science or art." This advisory function is one which still distinguishes the National Academy of Sciences from other scientific institutions. Thus the war activities of the newly founded academy supplemented the work of the commission and actually supplanted many of its activities almost before it had got into full operation. Some of the problems investigated dealt with the construction of iron vessels, others with problems of Army equipment, such as paint preservation, and one problem is recorded under the amusing title, "On the question of tests for the purity of whiskey," undertaken at the request of the surgeon general of the Army.

The first president of the academy was Bache, succeeded after his death in 1867 by Joseph Henry. Surveying the effects of the war on science and of science on the war, Henry declared:

> The organization of this academy may be hailed as marking an epoch in the history of philosophical opinions in our country. It is the first recognition by our government of the importance of abstract science as an essential element of mental and material progress. . . .
>
> It is not enough for our government to offer encouragement to the direct promotion of the useful arts through the more or less fortunate efforts of inventors; it is absolutely necessary . . . that encouragement and facilities should be afforded for devotion to original research in the various branches of human knowledge. . . . Heretofore, but two principal means of distinction have been recognized in this country, viz.: the acquisition of wealth and the possession of political power. The war seems to have offered a third, in bestowing position and renown for successful military achievement. The establishment of this academy may perhaps be regarded as having opened a fourth avenue for the aspirations of a laudable ambition, which interferes neither with our national prejudices nor our political principles, and which only requires the fostering care of government to become of essential benefit and importance not only to this, but all the civilized countries of the world.[6]

The patriotism of such men as Henry, Bache, and Davis set a very high standard of conduct for American scientists in the years to come. That their successors lived up to that high standard is manifest in the history of American science since the Civil War. The National Academy, founded during the war years, lives today and flourishes and has continued to play during peace and war the role envisaged for it by its founders. At the close of the third great war in which our scientists have given conspicuous service to the nation, we may look with equal pride on the splendid activities of our present scientific effort and the first large-scale, co-ordinated scientific war effort, that of the Civil War.

[6] True, *op. cit.*, pp. 14, 15.

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THE TREND OF AFFAIRS

(*Continued from page 158*)

were later collected, and although the pieces were small, British experts succeeded in fitting them together so that they had a very good idea of the rocket's size and performance.

The first V-2 actually used crashed down in a suburb of London on September 8, 1944. By Christmas of that year the Germans claimed to have fired the 1,000th V-2, London and later Antwerp being the principal targets.

V-2 consisted, from the top down, of the warhead, filled with amatol (a mixture of T.N.T. and ammonium nitrate), the instrument compartment, the alcohol tank, the oxygen tank, and the propulsion unit. The latter consisted of a steam turbine, operated by bringing hydrogen peroxide and calcium permanganate together, which drove two fuel pumps, delivering the oxygen and the alcohol to the rocket motor with a working pressure of about 350 pounds a square inch.

The rocket stood vertically on a concrete platform or hard ground, and the firing procedure was as follows: The valves controlling the alcohol and the liquid oxygen were turned on. Underneath the exhaust nozzle a special black-powder torch was blazing. The fuel caught fire, and the rocket motor began to work, although far too weakly to lift the 12-ton rocket. When the observer felt sure that the rocket motor was burning properly, he started the turbine by electric control. The turbine needed about three seconds to achieve full speed, then the fuels were fed forcibly into the motor, and the rocket took off, vertically. At an altitude of a little over eight miles, the gyroscopic controls began to tilt the longitudinal axis of the rocket in the proper direction; some 47 seconds after take-off, the angle was 45 degrees. The fuel supply lasted for 70 or 71 seconds, and by that time the rocket had reached a speed of about 3,500 miles an hour. The whole trip, from take-off to crash, took about 5 minutes; the operational range was about 180 miles (maximum range observed was 220 miles); and the peak altitude along the trajectory was about 60 miles.

The development envisaged by the Germans called A-9 was an A-4 rocket with highly swept-back wings, which would have added a hundred miles or so to the range. Development A-10 was an 85-ton rocket designed to serve as a lower step for an A-9, and the combination

(*Continued on page 196*)

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THE TREND OF AFFAIRS

(*Continued from page 194*)

of the two was for the bombardment of American cities; the trip would have taken about half an hour over a 3,500-mile range. Later on, the A-9 and A-10 combination was to get another lower step which would have enabled it to establish a station in space, the ultimate goal of the German rocket experts as far as earthbound operations went. The space station, in turn, would, of course, have served for the launching of true spaceships.

The following figures for A-4 or V-2 were made public in London on November 1 by W. G. A. Perring:

Over-all length of rocket	46 ft.
Length of warhead	5 ft. 11 in.
Length of instrument compartment	4 ft. 8 in.
Length of fuel tanks, together	20 ft. 3.5 in.
Length of "power bay" (turbine, pumps, rocket motor)	14 ft. 7.5 in.
Maximum diameter	5 ft. 5.3 in.
Diameter over fins	11 ft. 8 in.
Take-off weight, fully fueled	12.5 tons
Weight empty, but with warhead	8,900 lbs.
Weight of warhead	2,150 lbs.
Weight of instrument compartment, with instruments (gyros)	975 lbs.
Weight of oxygen tank, with insulation	1,560 lbs.
Weight of alcohol tank	235 lbs.
Weight of oxygen (liquid)	10,940 lbs.
Weight of alcohol (some used for cooling)	8,370 lbs.
Weight of stabilizing vanes, and so forth	1,335 lbs.
Weight of turbine-pump unit	880 lbs.
Weight of rocket motor and fittings	1,025 lbs.
Weight of fuels for turbine	400 lbs.
Length of rocket motor, approximately	5 ft. 8 in.
Maximum diameter of rocket motor	3 ft. 1 in.
Fuel consumption	275 lbs./sec.
Endurance at full flow, approximately	70 sec.
Thrust of rocket motor	60,000 lbs.
Estimated exhaust velocity	7,000 ft./sec.

In addition to the projects growing out of the successful completion of *Fernrakete* A-4, the Germans had a large number of other rocket developments under way when their laboratories and factories were captured by the Allies.

(*Concluded on page 198*)

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THE TREND OF AFFAIRS

(*Concluded from page 196*)

One of the most interesting of them is the piloted anti-aircraft rocket *Natter* (viper), which fails to fit into any normal classification. It was a strange mixture of rocket airplane and straight rocket, being of all-wooden construction and 30 feet 6 inches in length. It looked like an airplane fuselage, however, and had an airplane-type tail assembly. It was also equipped with very short, wide wings, producing a total wingspread of just 13 feet. The power plant of the *Natter* was a large liquid-fuel rocket motor, operating on hydrazine hydrate and alcohol and capable of delivering thrusts varying from 220 pounds to 3,300 pounds at sea level. Because of the reduction of air resistance and consequently higher exhaust velocity, the thrust of 50,000 feet amounted to 3,800 pounds, burning the same amounts of fuel as required for a thrust of 3,300 pounds at sea level.

The *Natter* took off with the aid of a number of booster powder rockets from a vertical launching rack. During the vertical ascent the pilot was inactive, but when reaching the desired altitude he was to level off the *Natter* and race into an Allied bomber formation. There he was to fire twenty-four 73-millimeter projectile rockets which filled the nose of the *Natter*. Then the *Natter* would break in two, ejecting the parachute-equipped pilot. The structure itself was to be expended, but the large rocket motor was to be floated to the ground, by means of another parachute, for later re-use.

The conception of this weapon was decidedly an admission of defeat in the air, since it could not possibly be used except over home territory.



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FORD W. SAMMIS '28, 433 South Spring Street, Los Angeles 13

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EDWARD F. ABBOTT, JR. '31, Birtman Electric Company, 4140 West Fullerton Parkway, Chicago

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WALTER R. C. RUSSERT '18, Anaconda Copper Company, Butte

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LOUIS A. METZ '23, Ceco Steel Products Co., 1141 North 11th Street, Omaha

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TECHNOLOGY MEN IN ACTION

THE ALUMNI FUND — ITS PROBLEMS AND GROWTH

Death and Taxes

REMEMBER Benjamin Franklin's prophetic words, ". . . in this world nothing is certain but death and taxes"? Prophetic, because in his time governments had hardly begun to realize what golden opportunities taxation offered. Nor had it dawned upon them that taxes need not stop at death.

Recently a booklet appeared detailing the reasons why colleges and charitable organizations merit continued and increased private support, and outlining various ways in which this support might be given with mutual benefit. One section especially is of interest to all of us and is well worth quoting, since it points out that even during this period when taxation has reached an all-time high, our government fully realizes the importance of encouraging the support of privately endowed institutions. Certainly, no matter how the tax picture may change in the future, that factor will not be overlooked.

> "In the midst of war, when the need for revenue was greater than at any other time in history, and tax rates soared, Congress continued to allow contributions to be deducted for income tax purposes. In fact, it even allowed a slight rise in the permissible 'ceiling' on such gifts. This action was eloquent testimony to the importance of continuing private support of charitable and educational institutions. According to the present law, an individual is allowed a deduction for such contributions up to 15 per cent of his adjusted gross income — which is, broadly speaking, gross income less business deductions.
>
> "It is important to note, too, that the tax deduction is permitted on the basis of the fair market value (not the cost) of the gift. Many people apparently do not realize the extent of the permissible deduction because studies in the past have shown that many do not take full advantage of it.
>
> "Obviously, the larger your income and the higher your tax bracket, the lower the net cost of your gift. Yet tax rates are so high that gifts from persons of relatively modest incomes can be made at low cost.
>
> "Corporations, as well as individuals, are allowed to claim contributions and gifts as deductions from income for tax purposes. The 'ceiling' is a little lower than in the case of individuals, however, and a corporation may not deduct as contributions more than five per cent of net income before taking charitable contributions into account, unless such excess qualifies as an ordinary and necessary business expense of the corporation."

The above was headed, "How to be Generous but Thrifty." The two can be made synonymous.

M.I.T. MEN AT WAR

Up to December 20 over 9,092 Institute Alumni, including 35 Admirals, 8 Commodores, and 95 Generals, were recorded as being in the active naval or military services of the United Nations. There were 251 Alumni who had been decorated, and 157 who had made the supreme sacrifice.

With its issue dated November, 1942, The Technology Review began publishing "M.I.T. MEN AT WAR." Although hostilities have ended, The Review plans to continue this page for the next several months in order to record information on M.I.T. men in the services which, to date, has been impossible to obtain. As a matter of convenience, promotions and corrections in the rank previously given are grouped under a single heading, "Changes in Rank." The Review Editors are greatly indebted to the many Alumni and other readers who are continuing to co-operate so helpfully in reporting inevitable errors of omission and commission which they note in these listings.

NEW DECORATIONS

1914 Waitt, Alden H., *Brig. Gen.*, U.S.A., Legion of Merit; Distinguished Service Medal — in connection with Chemical Warfare Service.

1939 Olson, Creighton B., *Capt.*, U.S.A., Bronze Star.

1940 Goldblith, Samuel A., *Capt.*, U.S.A., Silver Star; Presidential Citation; 2 Oak Leaf Clusters.

Schneller, George O., *T.Sgt.*, U.S.A., Purple Heart.

1941 Avery, Henry, *Maj.*, U.S.A., Legion of Merit — for outstanding work immediately following the landing at Salerno.

Hartshorne, Pierre F., *Capt.*, U.S.A., Bronze Star.

1942 Kellogg, William W., *Capt.*, U.S.A., Bronze Star — for action along the Roer River; Air Medal — Holland Airborne invasion; Purple Heart — Cassino, Italy; Russian Order of Alexander Neusky; Belgian fourragère for Croix de Guerre; Holland Order of William.

10–44 Guptill, Frank E., Jr., *A.R.M.2c.*, U.S.N., Distinguished Flying Cross; Air Medal with 3 stars; Purple Heart — Japan.

NEW LISTINGS

U.S.A.

1931 Carr, Amos J., Jr., *Capt.*
1943 Potts, George W., *T.5.*
2–44 Hart, Alfred L., *Lt.*
Reeves, Courtney H., Jr., *Lt.*
2–46 Berresse, William G., *T.4.*
Bloomer, Charles K., *Pvt.*
Esson, David J., *Pvt.*
Morgan, Harold V., *Pvt.*
Stickney, Kenneth W., *Pvt.*
10–46 Black, Andrew, *Pvt.*
Blocher, Richard H., *Pvt.*
Fleischer, Richard L., *Pvt.*
Moulds, Reuben F., Jr., *Pvt.*
2–47 Ayvazian, Mihran, *Pvt.*
Becker, Colman L., *Pvt.*
Bergmann, Carl A., Jr., *Pvt.*
Blandino, James F., *Pvt.*
Bohanske, Thomas A., *Pvt.*
Boyles, Henry B., *Pfc.*
Collins, Bertram F., *Pvt.*
Cox, Russell N., *Pvt.*
Currie, Charles, Jr., *Pvt.*
Dawson, Victor C. D., *Pvt.*
Gaffey, John R., Jr., *Pvt.*
Hardin, David K., *Pvt.*
Harsch, Roger D., *Cadet.*
Jartman, Marc R., *Cadet.*
Joy, Warren, *Pvt.*
Joyce, Robert M., *Pvt.*
Koenig, Richard H., *Pvt.*
Mann, Nathaniel, *Pvt.*
Millen, Irwin W., *Pvt.*
Nesbitt, Robert L., 3d, *Pvt.*
O'Brien, Robert T., *Cadet.*
Rosenberg, Bernard C., *Pvt.*
Ryder, James E., *Pvt.*
Simpson, Melvin O., Jr., *Pvt.*
Surprenant, Norman F., *Pvt.*
Teager, Arthur R., *Pvt.*
Thomas, John W., *Lt.*
Toomey, Joseph D., Jr., *Cadet.*
Watters, Warren K., *Pvt.*
10–47 Craig, Alan L., *Pvt.*
Goldhammer, Raoul, *Pvt.*
Maudlin, Robert V., *Pvt.*

U.S.N.

1933 de Give, Laurent, *Lt.Comdr.*
1943 Mark, William, *S.1c.*
2–46 Anderson, Herbert E., *S.1c.*
Baker, William H., *Ens.*
Bowman, Edward H., *S.2c.*
Brown, Francis, Jr., *S.1c.*
Conlon, Joseph M., Jr., *H.A.1c.*
Conrad, Waller M., *S.1c.*
Crinklaw, Douglas L., *S.1c.*
Deuber, George B., *R.T.3c.*
DeVito, Anthony P., *Ens.*
Dowst, Wayne, *S.1c.*
Fulton, Garland L., *S.2c.*
Haines, Jesse H., *S.1c.*
Hoover, Lloyd N., *Mid.*
Hurowitz, Marvin, *S.1c.*
Johnson, Hooper D., *S.1c.*
Jones, Ralph S., *F.1c.*
Judson, Arnold S., *S.1c.*
Kaewert, Herbert R., *R.T.3c.*
Kirkpatrick, John R., *R.T.3c.*
Kisluk, Walter, *S.2c.*
Littlefield, John B., *R.T.3c.*
Lombardi, Jack P., *S.1c.*
Lund, Walter W., Jr., *R.T.3c.*
Mark, Robert C., *S.1c.*
Mechta, John, *S.1c.*
Metcalf, John T., Jr., *Mid.*
Miller, Montague G., *A.R.M.3c.*
Moller, Peter, 3d, *S.2c.*
Monosson, Adolf F., *S.1c.*
Murphy, John H., *Mid.*
Phillips, Harvey R., *Ens.*
Pierce, Norton T., *Ens.*
Rice, Harry C., Jr., *Ens.*
Sabelli, Anthony J., *Ens.*
Scully, Richard J., *S.1c.*
Simpson, William W., *F.2c.*
Sutcliffe, Elbert G., Jr., *S.1c.*
Wales, Robert L., *R.T.3c.*
Wallace, Donald L., *S.2c.*
Walton, David L., *A.S.*
6–46 Barlow, Niles L., *A.S.*
Edgar, Robert H., *S.1c.*
Hemphill, John M., 2nd, *Mid.*
Keller, Charles R., Jr., *H.A.1c.*
Noble, Donald W., *S.1c.*
Tepper, Arnold, *S.2c.*
Van Buiten, Robert D., *S.2c.*
10–46 Abroms, Harold L., *A.S.*
Bangser, William, Jr., *S.1c.*
Battey, Hoyt E., Jr., *S.1c.*
Benson, Robert J., *A.R.M.3c.*
Bergsten, Floyd C. A., *S.1c.*
Cahn, Sylvan L., *S.1c.*
Cassady, William F., *S.2c.*
Clarke, Hugh J., *S.1c.*
Coppernoll, Robert D., *S.1c.*
Corson, Raymond F., *S.2c.*
Fier, Robert D., *S.1c.*
Friedlander, Philip J., *S.1c.*
Gage, William B., *S.1c.*
Gordon, Alfred N., *A.R.T.3c.*
Heller, Robert C., *A.C.*
Kee, Norman L., *S.1c.*
Koster, George F., *S.1c.*
McLaughlin, George F., *S.2c.*
McNally, Matthew A., Jr., *A.S.*
Moore, Michael J., *R.M.3c.*
Nichols, James W., *S.1c.*
Oard, William M., *A.S.*
Oddo, Gilbert L., *Aer.M.1c.*
Reilley, Victor B., *S.2c.*
Sandock, Jules, *A.S.*
Sergeant, John R., *S.2c.*
Sivard, Frank L., *Aer.M.1c.*
Stern, Joseph A., *S.1c.*
Stiffler, Franklin R., *S.1c.*
White, Thomas B., *S.1c.*
Whitney, Robert L., *S.2c.*
Wildermuth, Richard E., *F.2c.*
Wylie, John E., Jr., *R.T.3c.*
Yostpille, John J., *S.1c.*
2–47 Amdur, Allen C., *S.1c.*
Ayres, Herbert F., *R.T.3c.*
Bjornson, George A., *S.1c.*
Bishop, Kenneth M., *S.1c.*
Blair, Watson K., *Q.M.3c.*
Burke, Robert H., *S.1c.*
Childs, Henry P., *S.1c.*
Colgan, Charles E., *S.1c.*
Collins, Alan W., *A.S.*
Collins, Robert J., *S.1c.*
Connolly, William H., Jr., *S.1c.*
Davenport, Alan T., *S.1c.*
Devine, Thomas J., *S.1c.*
Doheny, Robert E., *S.1c.*
Edgerly, William S., *R.T.3c.*
Eichenberg, John D., *S.1c.*
Ellis, Charles W., 3d, *S.1c.*
Emerson, Roger B., *S.1c.*
Estes, William C., *S.1c.*
Fabiszewski, Edward S., *S.1c.*
Fields, Eugene A., *S.1c.*
Fitzpatrick, Henry J., Jr., *A.S.*
Forsyth, William A., Jr., *S.1c.*
Forsythe, William M., 3d, *A.C.*
Freedman, Edgar A., *S.1c.*
Freeman, Walter J., *S.1c.*
Fulton, Langdon H., *S.1c.*
Garnjost, Kenneth D., *R.T.3c*
Gold, Frank L., Jr., *S.1c.*
Gregg, Robert D., Jr., *S.1c.*
Groves, Malcolm F., *S.1c.*
Haber, Kenneth M., Jr., *S.1c.*
Hagerman, Oliver S., Jr., *S.1c.*
Hands, Richard S., *S.1c.*
Hendershott, Howard E., Jr., *A.R.T.3c.*
Higgins, Thomas D., *S.1c.*
Horn, Harrison S., *S.1c.*
Huang, Theodore S., Jr., *S.1c.*
Hudgins, Merit W., *S.1c.*
Hudson, David V., Jr., *S.1c.*
Hudson, Thomas, Jr., *S.1c.*
Hunt, Duncan G., *S.1c.*
Israel, David R., *S.1c.*
Jenkins, Robert H., *S.1c.*
Josey, Clinton W., Jr., *Mid.*
Kaplan, Sheldon I., *S.1c.*
Kerwin, Edward M., Jr., *S.1c.*
Kincaid, William R., *S.1c.*
Kline, Granville B., *S.2c.*
Larson, Ray E., *S.1c.*
Lewis, Robert R., Jr., *S.1c.*
Leys, William H., *S.1c.*
McCarthy, Robert V., *S.1c.*
Maslon, James I., *S.1c.*
Mea, Thomas E., *F.1c.*
Michtom, Anton, *S.1c.*
Murphree, Bernard S., *A.S.*
Murphy, Joseph A., *S.1c.*
Murray, Robert M., *S.1c.*
Nies, Perry L., *S.1c.*
O'Connor, Robert F., *S.1c.*
Osgood, Donald R., *S.1c.*
Perley, Richmond, *R.T.3c.*
Pickett, Thomas W., *S.2c.*
Porter, Douglas, *S.1c.*
Powell, Aaron S., Jr., *S.2c.*
Radus, Adolph W., *S.1c.*
Ramsey, Donald W., *S.1c.*
Ray, George F., Jr., *S.1c.*
Ray, George H., Jr., *S.1c.*
Rorschach, Harold E., Jr., *S.1c.*
Rossbach, Leopold J., *R.T.3c.*
Ryan, William J., Jr., *S.1c.*
Sableski, Joseph J., Jr., *S.1c.*
Sampson, Elmer B., Jr., *E.M.2c.*
Sandman, Robert L., *S.1c.*
Schneider, Joseph, *S.1c.*
Silverstein, Mitchell, *A.S.*
Somma, Edward H., *S.1c.*
Stein, William B., *S.1c.*
Stevens, Robert L., *S.1c.*
Sundback, Eric H., *S.1c.*
Towles, William B., *S.1c.*
Voges, Robert L., *S.1c.*
Wagner, Walter F., Jr., *S.1c.*
Weisz, William J., *S.1c.*
Williams, Francis J., Jr., *S.1c.*
Wilmoth, Reed O., *S.1c.*
Witherell, Richard H., *S.1c.*
Youden, Robert H., *S.1c.*
6–47 Booth, Donald P., *S.1c.*
Goldfarb, Herman, *C.M.2c.*
Retzer, James E., *S.1c.*
Whetstone, Albert E., *A.R.M.2c.*
10–47 Best, Ronald C., *S.1c.*
Gabrielle, Anthony F., Jr., *S.1c.*
Gorman, Paul F., Jr., *S.1c.*
Lloyd, Ian K., *S.1c.*
McGorum, William B., Jr., *S.1c.*
Monroe, Thomas I., Jr., *S.1c.*
Stockel, Ivar H., *S.1c.*
Underhill, John A., *A.S.*
Wass, Harold S., Jr., *A.S.*

U.S.C.G.

10–46 Sullivan, Francis H., *Cadet.*
2–47 Gallaway, Charles F., *R.M.3c.*
Rowles, Harwood S., Jr., *S.1c.*

BELGIUM

Army

1931 Fraikin, Leon A., *Capt.*

CHINA

Army

6–45 Huang, Shih-Shain, *Capt.*

CHANGES IN RANK

U.S.A.

1917 Grayson, Edwin J., *Capt.* to *Maj.*
1918 Hamilton, Norman R., *Capt.* to *Lt. Col.*
1925 Davis, Ernest L., *Capt.* to *Lt. Col.*
1928 Francis, Edwin A., *Capt.* to *Maj.*
1934 Fentress, Carroll D., *Capt.* to *Maj.*
1936 Boulware, Ford M., *Maj.* to *Lt. Col.*
Donnelly, George E., *Capt.* to *Maj.*
Warmuth, Marcus F., *Lt.* to *Maj.*
1938 Heath, Thomas L., *Pvt.* to *Lt.*
Petroskas, John A., *Lt.* to *Capt.*
1940 Goldblith, Samuel A., *Lt.* to *Capt.*
Johnson, Fred J., Jr., *1st Lt.* to *Capt.*
King, Herbert B., *Capt.* to *Maj.*
1941 Avery, Henry, *Capt.* to *Maj.*
Gold, Arthur B., *Lt.* to *Capt.*
1942 Marsilius, Newman M., Jr., *Maj.* to *Lt. Col.*
10–44 *Bresler, Richard H., *A.C.* to *Lt.*
Coan, Edward M., *Pvt.* to *Sgt.*
Guild, Robert R., *Pfc.* to *T.5.*
Kangerga, Michael, *A.C.* to *Lt.*
Robba, Charles R., *Pfc.* to *T.3.*
Yeates, John S., *Pfc.* to *2nd Lt.*
6–45 Kiefer, Jack C., *Pvt.* to *Lt.*
2–46 Wilke, Robert R., *A.S.* to *Pfc.*
2–47 Fell, Thomas T., *Pvt.* to *Pfc.*

U.S.C.G.

1943 Ottinger, Guy L., *Lt. Comdr.* to *Comdr.*

U.S.M.C.

10–44 Spear, Lawrence W., *Pvt.* to *Lt.*

NORWAY

Army

1940 Rustad, Olaf S., *Pvt.* to *Lt.*

RANKS NOT PREVIOUSLY PUBLISHED

U.S.N.

10–44 Uretsky, Jack L., *A.S.*

BRAZIL

Navy

10–44 Pereira Pinto, Francisco F., *Capt.*

LIBERATED PRISONERS

1940 Goldblith, Samuel A., *Capt.*, U.S.A.

CASUALTIES

1941 ★Whitman, Harry G., Jr., *Ens.*, U.S.N. — while in a Japanese prison ship off Olongapo, Subic Bay.

10–44*Bresler, Richard H., *Lt.*, U.S.A. — plane crash in India.

★ Killed in Action † Missing in Action ‡ Prisoner of War * Died or Killed in Service ** Wounded

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Detroit Technology Association

On November 14 our first fall meeting was held at the University Club in Detroit. The speaker for the evening was George Calingaert '23, who is chief of chemical research for the Ethyl Corporation. Dr. Calingaert's subject was the atomic bomb. He gave a very stimulating and instructive lecture, starting with matter as it is broken down into protons, neutrons, and electrons, developing a careful outline through the unstable elements, and culminating in a discussion of what causes an atomic bomb to function and the resulting effects. Interest was so intense that, among the 40 men present, informal discussion lasted for an hour and a half.

An election of officers for the ensuing year was held, with the following results: David M. Sutter '26, President; Douglas B. Martin '25, Vice-president; Thomas F. Morrow '35, Secretary; and Francis H. Rutherford '28, Treasurer. The scholarship committee will continue to consist of Allyne C. Litchfield '17 and Charles T. Ellis '17. Our old stalwart, John E. Longyear '26, is honorary president and will continue to spark plug our organization. — THOMAS F. MORROW '35, *Secretary*, 16894 Birwood Street, Detroit 21, Mich.

Technology Club of Hartford

On November 29 we had our first dinner meeting of the year and one of the most successful in the history of the Club. Held at the City Club in Hartford, it was attended by 61 members and guests in spite of the fact that the first, and a very severe, snowstorm of the year coincided. The business meeting was presided over by Norman J. Vile '16, President, and was cut conveniently short in anticipation of the balance of the program.

As our guest speaker, we had George E. Valley, Jr., '35, technical editor of the Radiation Laboratory office of publications, who addressed the group on radar. Dr. Valley outlined the work of the Radiation Laboratory in the development of radar, illustrating his talk with slides and a sound movie. Many interesting features of radar were described, as well as a number of its heretofore secret uses during the war. A question period followed in which many of us took part, thus adding further to the interest of the evening. — LOUIS J. PROULX, Jr., '36, *Secretary*, 31 Wells Road, West Hartford 7, Conn.

Indiana Association of the M.I.T.

For our first meeting of the season, held on October 10, we were entertained and instructed by two films furnished by Howard S. Morse '03, Vice-president and General Manager of the Indianapolis Water Company and former President of our Association. Both films were on some phase of the subject "water," one being entitled "Construction Record of the Oaklandon Reservoir" and the other, "Water-way to Health." The former was a very complete record, much of it in color and spanning several years' work, of the construction of the Water Company's new reservoir northeast of Indianapolis. The lake behind the dam is the third largest lake in the state of Indiana.

The meeting was the first conducted by the new officers of the Association, Thomas G. Harvey '28, President, and Marshall D. McCuen '40, Secretary-Treasurer. At the meeting, C. L. Bouchard '36 was appointed vice-president and dinner chairman for this season to replace Arthur B. Ellenwood, Jr., '34, who left the city for a position with a firm in Cleveland.

In addition to the officers, the following Alumni were present: Joseph W. Stickney '96, Arthur I. Franklin '98, Walter W. Bonns '99, Howard S. Morse '03, Frank C. Balke '14, George P. Allen '16, V. A. Schlenker '22, Harry C. Karcher '25, Robert C. Wallace '27, Malcolm Mitchell '28, Russell Fanning '30, and G. W. Klumpp '30. Mr. Harvey's father, R. G. Harvey, was a guest.

On November 9 a very fine dinner dance, which we hope will become an annual affair, was held at the Athenaeum Turners. A total of 26 Alumni, wives, and guests enjoyed the fine Thanksgiving-style turkey dinner and danced to the lively music of a three-piece orchestra. After dinner, Tom Harvey '28, President of the Association, introduced Lowell L. Holmes '23 as the toastmaster for the occasion. Mr. Holmes proceeded to put the assembly in the best of spirits to enjoy the remainder of the evening. The prize (if there had been one) for the most auspicious dancing would go without question to Russell Fanning '30 and his wife, who explained that they had learned how at Faculty Club meetings at the Institute several years back. The following were the Alumni present: J. Lloyd Wayne, 3d, '96, George P. Allen '16, John H. Babbitt '17, Lowell L. Holmes '23, George E. Mason '25, F. Sidney Badger, Jr., '27, Robert C. Wallace '27, Thomas G. Harvey '28, Russell Fanning '30, G. W. Klumpp '30, Marshall D. McCuen '40. — MARSHALL D. MCCUEN '40, *Secretary*, 6037 Norwaldo Avenue, Indianapolis 5, Ind.

Technology Club of the Philippines

On the evening of November 21, a large group of former M.I.T. students held an informal meeting at the newly opened Roosevelt Red Cross Club in the heart of war-battered Manila. Not since Dr. Compton visited the Philippines had there been such a Technology gathering in the Far East. Having been conceived in the good old Technology manner (over steins of beer), this meeting went forth in great fashion. Many old friendships were renewed and dim memories of the past refreshed, as 40-odd Technology students conducted a big "bull session" before and after a short business meeting. Two Filipino graduates of the Institute, Bernardo Abrera '32, and Max I. Planes '41, were among those present at the meeting. They were able to cast some light on past M.I.T. activities in the Manila area and have offered many valuable suggestions concerning possible meeting places and programs for future gatherings. It was decided that another meeting should be held on December 12. The following committee was appointed to make the necessary arrangements: Bernardo P. Abrera '32, Max I. Planes '41, Bill Bright '43, Frank S. Smith, Jr., '43, Stan Porosky '43, and Ken G. Scheid '44.

Those attending this meeting are listed herewith: Bernardo P. Abrera '32, John E. Barry '42, Frank K. Bennett '43, William M. Boyle '44, John H. Brannan '41, William J. Bright '43, Julian M. Busby '45, Randall S. Caswell '44, Robert I. Clarke '44, Edward M. Coan '45, William E. Coleman '34, Arthur K. Deming '35, Marvin H. Dixon '30, Robert S. Faurot '44, De Loss Kahl, Jr., '44, Burton H. Kahn '45, Kenneth A. Lambert, Jr., '45, Charles W. Loufek '45, Franklin D. Mabbett '43, John V. Minges '42, David B. Mitchell '42, Jay Mullen '45, Lawrence E. Nelson '44, George Oetinger, Jr., '25, Donley J. Parr '45, Hugh G. Pastoriza, Jr., '43, Max I. Planes '41, Henry L. Pohndorf '41, Stanley M. Porosky '43, J. Laurence Powell '45, George H. Rabson '33, James F. Robertson, Jr., '45, Lincoln W. Ryder '33, Albert C. Saer '43, Paul B. Sawyer '46, Kenneth G. Scheid '44, William D. Sewall '45, Frank S. Smith '43, Robert B. Smith '44, William D. Stahlman '45, Newton A. Teixeira '44, Philip S. Wilder '23, Henry W. Williams '25. — STANLEY M. POROSKY '43, *Temporary Secretary*, Headquarters, AFWESPAC, OCSigO, Signal Supply Division, A.P.O. 707, in care of Postmaster, San Francisco, Calif.

New Haven County Technology Club

The first meeting of the season was held on October 26 at the home of C. E. Smith '00. The ladies were invited, for the first time in about 10 years, but the outstanding success of the evening indicated immediate revision of our previous custom. The program of movies, dancing, singing, bridge, cards, and games had been skillfully arranged by Herb Polleys '18, William Young '29, Morton Plant '31, and Stuart Boyd '18. Amazing quantities of tasteful and attractive refreshments were served by Mrs. C. E. Smith, Mrs. Roy Parsell, Mrs. C. A. Williams, and Mrs. Herbert Polleys. The announced restriction of no more than nine trips to either one of the two punch bowls was not enforced, despite an attendance of about 72 members, wives, and guests. The scant supplies for the "without" punch bowl did run short very early in the eve-

ning, but there were no complaints about the quality of the substitute concocted by the master hand of Chairman Polleys.

Vice-president Buck '29 welcomed the group with a few appropriate remarks, called for the Secretary's report on the June meeting, and then turned the evening over to entertainment. A very interesting film portraying the development of helicopters was first presented through the courtesy of C. A. Moeller '33. Subsequently, one had but to enjoy himself or herself until adjournment, shortly after midnight. Identification cards and a complete guest register aided in stimulating acquaintance.

Concert and variety music was furnished by Carl Blanchard '18, piano, Charlie Williams '21, banjo, and Connie Moeller, violin. A large group enjoyed dancing to the latest recorded hit tunes. The host very ably set the pace for this activity. Several groups played cards, and Stuart Boyd, as activity chairman, gallantly presented the ladies' first prize to Mrs. Boyd, while Harold Manning '12 quietly earned first among the male competitors. President and Mrs. Gada were present, and during the evening the members expressed their appreciation of Nat's past interest in the Club and wished him well in his new work in Syracuse. Past President and Mrs. Percy Harvey unexpectedly dropped in on their way to Boston, as a step in returning to civilian life, and renewed their many friendships.

Among the Alumni present were the following: Marshall S. Wellington '16, Joseph L. Hetzel '23, John P. Ramsey '25, Floyd W. Buck '29, Margaret van Pelt Vilas '30, with her husband Charles Vilas, A. Morton Plant '31, Albert I. Blank '37, and James N. Hendel '43. Alumni attending with their wives were as follows: Charles E. Smith '00, Harold G. Manning '12, Roy L. Parsell '14, G. Vincent Maconi '15, Ettore Ciampolini '16, John R. Freeman, Jr., '16, Haig N. Solakian '17, Carleton W. Blanchard '18, Stuart Boyd '18, Herbert R. Polleys '18, Harry H. Mardoian '19, Charles A. Williams '21, A. Royal Wood '21, Walter R. Weeks '24, Alan W. Crowell '25, Natale Gada '26, Malcolm A. Jenckes '26, Laurence B. Cheney '27, Lawrence B. Grew '27, D. Stuart Pope, Jr., '27, Gerald B. Yudkin '27, Percy E. Harvey '28, Roger W. Purssell '28, Frank P. Nettleton '30, Frederick E. Brooks, Jr., '31, C. Alvin Moeller '33, Thurston S. Merriman '39, Judson M. Rogers '40, Frederick G. Stroke '40, and Harvey R. Sommer '44. — Lawrence B. Grew '27, *Secretary*, Southern New England Telephone Company, New Haven, Conn.

Technology Club of New York

As we go to press this month, news is definitely on the short side. The biggest news will undoubtedly come too late, in the form of the Technology Banquet being held at the Biltmore Hotel, honoring Dr. Compton's 15th year as president of the Institute, and also in joint celebration of both V-E and V-J days. Dr. and Mrs. Compton will be the guests of honor, but at this writing many more members of the Corporation and outstanding Alumni are expected to be present. The list of patrons and patronesses which Al Glassett '20 has assembled almost looks like a technical edition of "Who's Who in America." From all indications now it should be a most outstanding party, and one that will induce those who did not attend to be on hand for our next. Bill Mueser '22, chairman of the banquet committee, is struggling along with all the details and doing a grand job on them. Bradley Dewey '09, President of Dewey and Almy, will introduce Dr. Compton, lest there be anyone present who does not already know his reputation; and our old friend and financial adviser, Horace Ford, Treasurer of the Institute, will also occupy a most prominent place at the head table.

Due to certain necessary changes in our employee personnel at the clubhouse, our records are in somewhat of a mix-up. Pat Patterson, club manager for the last 10 years, resigned, and we are gradually shifting the paper work over to the Williams Club. This situation induces me to bring up again the subject of your correct business and home addresses for club purposes. No "Register of Former Students" has been published since 1940, and, as you well know, there has been a terrific turnover of men and jobs since that time. You will be doing yourself, the Institute, and the New York Club, a big favor, if you will inform either me or the Institute of your present location.

The re-employment committee, under the direction of Jack Fruit '02, is really on the ball now, and I understand is seeing several men each week. We hope that any Tech men, members of the Club or not, who happen to see this item and can make use of this service, will take advantage thereof. That is what it is for, and the more problems are put to the committee, the more they learn and serve.

Win McNeill '17, the new Club Treasurer, is going to town on the books. If there is any doubt in your minds where you stand financially, with the Club, don't wait to be called; just take it up with Win direct. To judge from recent conversations with Win, however, not many of us seem to be in arrears on this score.

I tried to catch Sam Reynolds '22, chairman of the membership committee, to get the latest score on new members, but he's back on the road now, asking for the order and I missed him. Mrs. Humphrey, who by the way, will answer your questions at the clubhouse in lieu of Pat Patterson, furnished me with a few names which I think are new and list herewith. Thus we welcome to our midst, as new members, the following: St. E. T. Piza '15, G. W. Bricker, Jr., '23, M. S. MacNaught '24, F. A. Wilkinson '26, H. N. Bates '30, P. O. Crawford, Jr., '39, H. I. Kram '42, and J. J. Guarrera '43. If I have missed any, I will try to pick them up next time. If, due to the present state of confusion of our records, I have repeated names, please don't complain, for repetition is the life of my business, advertising.

With this edition, we revive, or inaugurate, the custom of attempting to welcome visiting firemen to the club headquarters. During the past month, the following men dropped in: Ralph T. Jope '28, Treasurer of the Alumni Association; F. G. Fassett, Jr., recent Editor of The Review; Jim Killian '26, Technology's popular Executive Vice-president; Lieutenant Colonel Henry Shore '24, bedecked with service ribbons; E. D. McCleod '33; Eric Etherington '20; Gray Jensvold '37; Bissell Alderman '35; Cole A. Allen '33; W. H. Callahan '26; E. V. Piel '38; E. E. Chute '29; P. B. Sadtler '06; and F. A. Wilkinson '26. So long for this time, and we hope to convey to you in our next report most of the intimate details of our December 5th party. — William W. Quarles '24, *Secretary*, McGraw-Hill Publishing Company, 330 West 42d Street, New York, N.Y. William L. Keplinger, Jr., '24, *Publicity Committee*, care of Johns-Manville Corporation, 22 East 40th Street, New York 16, N.Y.

M.I.T. Club of Northern New Jersey

The Club has collected extensive data from its membership and on the basis of this information is planning to return to its pre-war setup. The various committees are very active, and this January heralds the return to monthly get-togethers, culminating in the spring in a really bang-up picnic, banquet, or some equally interesting meeting. Returns from the first questionnaire are still trickling in, bringing answers and donations to the "kitty." The bank balance is about $500, which makes it possible for the Club to enlarge its activities as indicated. If any Alumni did not receive this questionnaire or the second mailing notice, they should write to Kebe Toabe '15, 408 Winthrop Place, Elizabeth 3, N.J., so that their names may be put on the mailing list. Every effort is being made to get an accurate and complete mailing list of all Alumni living in this area, whether working here or not.

In addition to the entertainment activities, the committee on re-employment, for returning veterans and those displaced by changes in war manufacturing, is very active. This committee works in conjunction with the Placement Bureau in Cambridge. Any Alumni knowing of an employment opportunity or seeking a placement should communicate with the committee chairman, George A. Chutter '21 (office: 90 West Broadway, New York City — telephone, REctor 2-4078; home: 109 Central Avenue, Glen Rock, N.J. — telephone, RIdgewood 6-1799 M). The several committees of the Club hope that, now that the war is won, the gas rationing ended, and the extra long hours of work somewhat curtailed, they may be of real service to Alumni of this area. They solicit criticisms and suggestions as to how to make this Club of more service to Tech men. Send your suggestions to A. Raymond Brooks '17, President, Wayside, Brantwood, Short Hills, Summit Post Office, N.J., or to Frank O. Pierson '29, Secretary, 15 Wyndehurst Drive, Madison, N.J.

The meeting on November 1 featuring Waldo G. Bowman, editor of *Engineering News-Record* and technical war correspondent with the Army Engineers and Navy Seabees, was attended by about 100 hungry Tech men. The food was good and Bowman better — his slides showing how bridges were pushed across rivers, around precipitous cliffs, and over chasms elicited almost as much interest as the occasional picture of Paris (after dark). Dr. Foster '25 came down from the Institute to tell the audience about the work of the Placement Bureau. His report on the shortages of engineers, particularly in research and development, was quite a surprise to the men

present. Many of us had thought the Placement Bureau probably had more job seekers than jobs. Some of the hardy stayed until eleven o'clock to see the motion picture film lent by Alcoa. — FRANK O. PIERSON '29, *Secretary*, 15 Wyndehurst Drive, Madison, N. J.

Technology Club of Philadelphia

Should you receive your January issue of The Review before our meeting at the Bellevue-Stratford on January 15, we hope that you will join us to hear President Compton and Bradley Dewey, former rubber czar. If not, we can only hope that your name has been on our active list; in which case you have, of course, received a notice of the meeting sufficiently far ahead to make it possible for you to plan to be with us. Again, paradoxically, your new officers will have been elected at this reading. We regret that we cannot announce them by name to those who are unable to attend the January meeting until the March issue, if, indeed, we can meet that dead line.

On the seventh of November a meeting of the placement planning and guidance committee was held at the Penn Athletic Club. Present were Edward J. Healy '23, chairman, President Anderson '15, Francis J. Chesterman '05, Henry W. Jones '26, Charles B. Weiler '25, and Edwardes S. Petze '28, Secretary. As a result of this meeting, it was felt advisable, for proper co-ordination, to divide the functions of the committee into two general groups: namely, those graduated in or after 1940, and the second group, those before 1940. These groupings were decided upon because the first classification is made up primarily of men who either have been in the armed forces or have worked solely in a war connection since graduation. The second group of men, graduated before 1940, have been basically men coming out of the service, men coming from war plants, or those men, whether or not from either of the above, who are seeking a change. Upon a man's applying for assistance, the chairman will write to the applicant, forwarding a blank to be filled out. In addition to the information requested on the form, the man will be asked whether or not he may return to his former connection. A list of companies to which he has applied in the last month or two will be requested. An interview will then be arranged with a committee member, depending somewhat on the bent of the applicant, and the next step determined.

The oft-mentioned directory is now in the hands of the printer and, before you read this, will have been distributed to active members. It is hoped that the information included therein will prove an aid in your professional or social activities. Since this is, to our knowledge, the first directory which has been prepared in so integrated a fashion, we shall welcome constructive criticism. The directory includes 219 Alumni, the largest number of active members in the history of this Club. For information about Alumni in the Philadelphia area, call JEFferson 0642. — EDWARDES S. PETZE '28, *Secretary*, Scott Paper Company, Chester, Pa. *Assistant Secretaries:* HAROLD BOERICKE, JR., '44, 5932 Overbrook Avenue, Philadelphia, Pa.; ROBERT M. HARBECK '28, Fidelity Machine Company, Philadelphia, Pa.

M.I.T. Club of Western Maine

On October 27, the Alumni of Maine and their guests sat down to a delicious steak dinner at the Augusta House at Augusta, Maine. It was a fair crowd, 31 persons being present, including the speakers and a few Alumni from the eastern part of the state, and last but not least, the ladies. This was the first meeting since Pearl Harbor, the last previous meeting having been held at the Lighthouse Inn near Augusta in September, 1941. By way of explanation, your Secretary has felt that in view of the gas rationing and food shortage, Alumni get-togethers should be out for the duration.

In the absence of the president, Doc Campbell '21, who is still on duty in the Pacific, Lew Nisbet '09 took charge of the meeting. Your Secretary reluctantly presented his resignation on account of ill health. Stanley W. Hyde '17 of Yarmouth was elected in his place. Lew Nisbet then introduced Professor Charles E Locke '96, Alumni Secretary. Professor Locke talked on reconversion problems at Technology, mentioning among other things the group of little houses being built for the benefit of the married veterans who are returning to the Institute for additional education. In closing, Professor Locke introduced Willoughby M. Cady of the Radiation Laboratory. Dr. Cady gave us a most interesting talk on radar. After explaining how radar worked and the uses to which it could be put, he reviewed the subject, using a sound movie, and finally gave us a "refresher course," using lantern slides. At the close of his talk, Dr. Cady touched briefly on the subject of atomic energy, stressing the serious import of the release of such tremendous power, which to date can be used only for the purposes of destruction.

The ex-Secretary wishes to take this opportunity to express his appreciation and thanks to all those who have assisted him and particularly to Stan Weymouth '19 and to Lew Nisbet, whose efforts made the Augusta meeting a success. — STANLEY W. HYDE '17, *Secretary*, North Yarmouth Academy, Yarmouth, Maine.

Technology Club of Shanghai

Since September, after an interruption of almost four years, the Club is again holding monthly meetings. Officers for the year 1941 will carry on the work for the remaining months of this year, until we have regular elections at the end of the year, as usual.

The September meeting was held on the 24th, with Robert S. Woodbury '28, a lieutenant commander, as the principal speaker, on the atomic bomb. Forty-two members out of a total of about 60 attended the meeting. We had our October meeting on the 27th, with Robert F. Seedlock '40, an Army colonel, as the principal speaker, on the topic of the Burma Road. Dr. Chu, special representative on General Stratemeyer's staff, related some of the latest news about Technology, particularly the Radiation Laboratory. Forty-five members and guests were present. Had not the time been in conflict with the Navy Day program, we should certainly have had a bigger crowd. A social meeting on November 24, attended also by the wives, provided a buffet supper and motion pictures showing the surrender.

Before the war we had successfully established the China Institute of Industrial Training, but it had to be suspended in 1941. A committee of seven has been appointed by President P. Y. Tang '23 to look into the ways and means of resuming this very useful institution.

Any correspondence to the Club should be addressed temporarily to the undersigned, and you will be informed as soon as a permanent address is established. — T. K. HSUEH '24, *Secretary*, 51 Passage 646, Tiendong Road, Shanghai, China.

Washington Society of the M.I.T.

Technology men in Washington had another fine monthly meeting on November 8 — as usual, the second Thursday in the month — at the Young Women's Christian Association. The room doesn't have any rafters, but if it did they would ring every time we sing "Sons of M.I.T." It is getting so that song has almost the standing of the Stein Song, and the fellows seem to put real energy into it. Harry Fisk '22, the quartet, and Joe Gaffney '28 at the piano are just the boys to lead it.

Bill MacMahon '22 had to make the sad announcement of the death of General Stewart C. Godfrey '07 in an air crash a few weeks ago. The general was a fine Washington member of our group and was actively interested in all the activities that we undertake. We shall miss him.

Proctor Dougherty '97 was caught flat-footed by Bill — Proctor had nothing to say. That is a rare occasion and worthy of note. When Bill asked him for his announcements — which usually run on for 10 minutes or so — all Proctor could do was to rise and tell how he was just back from New Hampshire and had met Miss Ham from Center Sandwich.

Major Edward Wallace Witcomb, Engineer Officer, British Army, provided the meat of the evening in his description of "Mulberry B," the floating port off the Normandy beachhead. We were fortunate to have him because the British had him scheduled on a tight program of activities which landed him in Chicago a couple of days before our night. He was permitted to interrupt his schedule and come to Washington to tell us his story. After a description of the concrete barges, the old ships for sinking as a breakwater, the long floating bridges necessitated by the 18- to 24-foot tide, and the secrecy which surrounded the project from the start, Major Witcomb showed a long motion picture presentation of the project. He was more than generous in his answers to questions, staying long after the Stein Song to talk with the fellows.

Present were: 1889: G. W. Stone; 1890: J. G. Crane; 1892: B. P. DuBois; 1893: G. W. Stose, P. H. Thomas; 1897: P. L. Dougherty; 1900: F. W. Southworth; 1902: G. E. Marsh; 1903: W. L. Cook; 1904: H. H. Groves, A. M. Holcombe, F. W. Milliken, G. N. Wheat; 1905: E. F. Kriegsman, O. C. Merrill; 1909: B. A. Robinson; 1911: David P. Allen, W. H. Martin; 1912: A. M. Pedersen; 1913: L. W. Parsons; 1914: F. P. Karns; 1915: A. D. Beidelman; 1916: W. H. Blank, W. L. Ogden, W. E. Wentworth; 1917: J. P. Ferrall; 1919: L. J.

Grayson, D. A. Lundquist, P. F. Swasey; 1920: John Nolen, Jr.; 1921: L. W. Conant; 1922: H. H. Fisk, C. A. Moore, J. R. Morton, Jr., W. K. MacMahon, R. K. Thulman; 1923: E. L. Akerly; 1924: W. V. Cash, P. C. Maynard, R. P. Schreiber, G. M. Tapley; 1926: T. L. Soo-Hoo; 1927: E. G. Cowen, M. D. James, G. C. Popps, G. E. Thomas; 1928: A. E. Beitzell, J. W. Gaffney; 1929: J. A. Plugge; 1930: A. F. Bird, C. W. Maskell, N. C. Nelson; 1931: A. W. Day; 1932: Lester Glickman, F. M. Moss, R. W. West; 1933: M. E. Gardner, J. F. Longley; 1934: J. F. Burke; 1936: J. V. Sharp; 1937: B. M. Loring; 1940: H. H. Davis; 1941: Franklin Hawkins; 1942: Z. W. Wilchinsky; 1944: J. M. Tome; staff: R. D. Bennett. — FRANK W. MILLIKEN '04, *Secretary*, 613 Greenwich Street, Falls Church, Va. ALBERT F. BIRD '30, *Review Secretary*, 5070 Temple Hills Road, Southeast Washington 20, D.C.

CLASS NOTES

1887

Our esteemed President, Dick Schmidt, observed his 80th birthday anniversary on November 14 at a reception given by his partners of the architectural firm of Schmidt, Garden and Erikson at their new and enlarged offices in the Monroe Building, 104 South Michigan Avenue, Chicago. The occasion commemorated not only the natal day of their senior partner but also the more than 50 years of existence of the firm which he founded and in which he is still the leading spirit. Cocktails were served rom 4:30 to 7:00 in the afternoon, followed by a reception and general reunion which lasted well into the evening. Friends, Tech men, clients, engineers, and others were present to the number of several hundred, all of whom apparently enjoyed the time of their lives. In one of the rooms was an exhibition of photographs of buildings designed by the firm, including Dick's first hospital building back in 1895, while another room contained the large assortment of presents and birthday cards from friends and well-wishers. The gathering furnished a wonderful opportunity for many of the old-timers to meet for the first time in many years and was in all respects an occasion long to be remembered.

Your Secretary feels that '87 men, though unfortunately few in number in these latter days, will be interested to know that the Scovill Manufacturing Company, of which our classmate Ed Goss was the head at the time of his decease, has been holding up to its splendid record for efficiency in World War II, as in World War I, adding more laurels to its high reputation by the production of many parts for the famed vacuum tube fuse, the number two secret of the war, surpassed only by the atomic bomb as the war's most effective secret weapon. For more than a year these parts were manufactured by Scovill without more than two or three key people's knowing exactly what they were being used for. The vacuum tube fuse is a five-tube radio sending and receiving set which fits into the nose of a large shell or can be attached to a bomb, rocket, or mortar shell. The fuse will set off the explosive charge whenever the shell is within effective range of its target. W. M. Goss, son of our late classmate, writes: "In addition to these parts, we produced, without one single failure, in excess of 30,000,000 large caliber artillery fuses during World War II, 25,000,000 of which were powder time train fuses of the very latest type and were used with great success on all fronts in all guns from the 75-millimeter through the 155-millimeter." Our sincere thanks are due Mr. Goss for the above interesting information. — NATHANIEL T. VERY, *Secretary*, 15 Dearborn Street, Salem, Mass.

1888

The two months' silence of our active and efficient Assistant Secretary has been broken by his letter of November 16, which I give herewith, as it explains everything in detail: "I have not written you lately as I have been having a nice long rest of two months, now practically completed. You see, on September 19, I took out membership in the Blue Cross, which provides two months' hospitalization. I had never been hospitalized and wondered how I could make use of this privilege. The question was settled the following day, by means of a collision with a Boston Elevated Railway bus. The Peter Bent Brigham Hospital did a good job, however, with their stitches, their penicillin, their sulpha drugs, and so on. I have been at home a fortnight or so and am just back from a trip to the hospital, where I received a clear bill of health and guarantee that I should be able to attend our 75th reunion."

As Sanford says, our 75th reunion is only 18 years distant, and we have come 57 years toward that "Diamond Jubilee" goal, so cheer up — the best is yet to come. There are still 52 names on our class roster. — BERTRAND R. T. COLLINS, *Secretary*, 76 Murray Place, Princeton, N.J. SANFORD E. THOMPSON, *Assistant Secretary*, The Thompson and Lichtner Company, Inc., Park Square Building, Boston 15, Mass.

1890

The attention of the Class is called to a recent publication entitled *Willis Rodney Whitney, Pioneer of Industrial Research*, a biography by John T. Broderick with foreword by President Compton. Harry Goodwin writes: "In this interesting book we have, after an account of early boyhood, student days at Technology and later in Germany, a good picture of the way in which the research laboratory of the General Electric Company was developed and of some of the great discoveries made there by Whitney and his distinguished coworkers. Much of this discussion is in Whitney's own words, quoted from conversations with the author, and reveals the philosophy which contributed so much to his brilliant success as a director. The latter part of the book is devoted to his many avocations, largely in the field of natural science — botany, zoology, and archeology. What he has found out from personal observation about land turtles, goldenrod galls, and so forth, would fill a volume. If our many-sided classmate would only write an autobiography, we should indeed have a treat. He has hinted to his biographer that he may do so after he has passed 80 and can take the necessary time from studying the processes of creation and carrying on experimental work. Knowing his enthusiasm for research, I am afraid we shall have to wait a long time for this. One error was noted in the tabulation of degrees and honors — which include five honorary doctor's degrees and nine medals — namely that his S.B. degree from Technology is listed as of 1894! Let us hope that this will be corrected in the next edition, as the Class of 1890 asserts its just claim to this illustrious son."

News of the death of Benton Sturges on July 5, 1944, was recently received. He was graduated in the General Course, and we have no information as to what he did in the first few years after graduation. After about 1900, "he was very active in the sale of summer homes at Lake Geneva, Wis., which is a very exclusive summer resort, some of the homes costing more than $100,000. After the 1929 stock market collapse there was practically no demand for expensive summer homes, and he devoted most of his time to his little farm in Lake Geneva, coming to the office on an average of about once a week," according to his secretary. His sister writes that he "retired from active business many years ago, resigned from his clubs, and lived very contentedly and happily on his farm, among his books and his friends. His illness was not overlong, and his classmates can still remember him happy as in his youth."

The Secretary and Mrs. Packard dropped in on Franklin Knight at Great Barrington, Mass., in October while enjoying the Berkshires' autumn foliage. We were delighted to find him and Mrs. Knight in excellent health and pleasantly located, although he had been obliged to cease as "a modest dirt farmer" because of lack of farm help. He reports that they have nine grandchildren. Possibly others in the Class may have more. Henry B. Pennell has changed his address from Boston to 612 North Cordova Street, Alhambra, Calif.

To 75 notices of our 55th reunion sent out last spring, no reply, either positive or negative, was received from the following: Beals, Mrs. Bennett, Carlton, Creden, Crossman, Davis, deBullet, Fitts, Flint, Foster, Hayden, Hazard, L. B. Holmes, Howells, LaRose, Paine, Pennell, Plumer, Poland, Roberts, Sears, Southworth, Stearns, and Wertheimer. The Secretary would like to get some news of these Alumni, either from them individually or from anyone who knows anything about them. — GEORGE A. PACKARD, *Secretary*, 50 Congress Street, Boston 9, Mass. HARRY M. GOODWIN, *Assistant Secretary*, Room 3-233, M.I.T., Cambridge 39, Mass.

1894

A letter from Arthur La Motte notified the Secretary of the death of Nelson Dalton. From personal letters written by Dalton to La Motte after a separation of 55 years and kindly sent for perusal, and from some other sources, it has been possible to prepare the sketch of his career here given.

Nelson Wait Dalton died on October 17, his 72d birthday, as the result of an automobile accident in Pennsauken township, N.J., while on his way to work from his home in Merchantville. His car was struck by a heavily laden truck at a street intersection, and he died a few hours later in the hospital. In his death the Class loses a member of marked ability and individual-

ity. Although he had not maintained close connection with the Class or the Alumni Office for many years, he will be remembered by Course VI men especially as a student, throughout his four years at Technology, with a personality and with a keen sense of humor made even more pronounced by a certain halting in speech. His career was an interesting and somewhat varied one.

Dalton was born October 17, 1873, the son of T. L. Dalton of Sandy Hill, N.Y., and entered with our Class in 1890. He took the Course in Electrical Engineering. In 1896 he became treasurer and general manager of the Bath Electric Illumination and Power Company of Bath, N.Y., and held this position until 1904, when he entered the employ of the Hartford Carpet Company at Thompsonville, Conn., as electrical engineer and later, in 1912, became chief engineer of the Bigelow-Sanford Company, of which the Hartford Company was a unit. This position he held for three or more years. Developing a keen interest in airplane design and aeronautical engineering, he joined the Curtiss Company and during World War I (1917–1918) was in charge of the experimental department of the plant at Garden City, L.I. Here he designed and built the first models of the Curtiss Company and the HS1-L, which was the "first and only plane put into production during the war and of which 2,000 were built for the Navy." During this period also, he designed and constructed some experimental aerial torpedoes at first controlled by human pilots but later catapulted and directed by an automatic unit developed by the Sperry Gyroscope Company. With the ending of the war the government lost interest in these flying torpedoes, which were somewhat like the flying bombs of the late war. Apparently there then followed a period of many years devoted to general engineering problems and inventions, especially in marine engineering, but with the outbreak of this war he again turned his attention to airplanes and was active in the E. G. Budd Manufacturing Company, and particularly the Budd airplane division, designing new types of planes and especially a hydroplane which was intended to take the place of the motor torpedo boats, being much faster and more comfortable. From the ideas of a French inventor he reconstructed a plane which became known as "Dalton's Duck" (See The Review for January, 1943). While at Budd's, his activities were varied and arduous. Early in 1943 he became the manager of the P-V Engineering Forum, Inc., of Philadelphia, where his inventive energies were largely centered on the building of a helicopter which he believed to be of superior design and performance. This company took over whatever was left of the Brewster Airplane Company when it was liquidated, and on Dalton fell the additional task of practically building and outfitting for it a new plant at Sharon Hill, Pa., supervising the transportation of stock and equipment, and at the same time keeping control over many projects which had been started under his supervision at the P-V Engineering Forum and with other companies for which he was a consultant. Of irrepressible energy, he was a man of many original ideas and practical inventiveness, as indicated by his approximately 100 patents. His tragic death ended an extremely busy and useful career. Dalton leaves a family — his wife, a son and two daughters, and three grandchildren. To them the sympathy of the Class is warmly extended.

La Motte's kindness in giving information regarding Dalton is much appreciated. They had been chums in a boys' school back in 1886–1888, and two years later both came to Technology but did not meet after the first week there. It was only by noting a mention of the "Dalton Duck" in The Review in 1943, that La Motte reestablished a contact by letter; several letters were exchanged, but they did not meet. La Motte's career has been one of the most striking, dangerous, and interesting of any of our classmates. After one year at the Institute, he entered the medical school at the University of Pennsylvania but, because of what he calls a "game leg" which prevented stair-climbing in the old elevatorless medical school, he left after three years to become a chemist with the Repauno Chemical Company at their dynamite works near Gibbstown, N.J. Thus began his life career as a (probably *the*) leading expert (he says "dabbler") in high explosives, both in manufacture and application under conditions of extreme danger. In this he has led a charmed life, having on innumerable occasions escaped destruction either by chance or by his own unusual foresight. Items culled from his diaries note that on one occasion he was delayed a few minutes in reaching a building which blew up, killing three of his associates; and at another time an explosion when he was present wrecked a building, killing three, but he was unhurt, although fragments fell all around him. Such escapes seem to have been common experiences with him. In 1903 he invented a nonfreezing dynamite better than any other that had ever been produced up to that time, but much too expensive to be then commercialized, and from that time forward his inventions in explosives, fuses, caps, and such, have been many and notable. He made the first T.N.T. produced in the United States and has made many other extremely important advances in the science. For 12 years he was in the field, investigating complaints, teaching customers how to use explosives safely, efficiently, and economically in mines, quarries, tunnels, and so on; and during this time he trained an efficient force of field men to do this type of work. In his field work he had, as he expresses it, "many close calls and wild adventures." A very constructive job was done in getting field men, laboratory men, and works men together to discuss their problems. The list of his developments is too long to reproduce here. Moreover, the Secretary could not properly evaluate them. His activities have not been confined to laboratory and plant operations, for he has edited and rewritten nine editions of the *Blaster's Handbook*, wrote most of the chapter on explosives in Peele's *Mining Engineers Handbook*, most of the publications on *Safety in Use of Explosives* for the Institute of Makers of Explosives, and the prize paper on "Proper Detonation of Explosives," which proved for the first time the directional effect of explosives. He has lectured before many engineering and scientific societies and in colleges, as well as to the Army Engineers, the Army War College, and so forth. Through trips abroad he became familiar with works and operations in the most advanced European countries. For 23 years, until his retirement three years ago, he was manager of the technical section of the explosives department of the Du Pont Company, and even after retirement his activities did not entirely cease. He certainly ought to have the degree of M.D. as master dynamiter, even if he did not wait to become a doctor of medicine. Ninety-four is proud that he was once a part of our Class.

Two recent callers have given the Secretary much real pleasure. W. H. Pratt dropped in one day and reported that he was just completing his service with the manufacturing section of the great Radiation Laboratory organization, with which he has been connected for two or three years. Although he had passed the retirement age of General Electric chiefs, he brought to his war work with the Radiation group much energetic service as well as invaluable experience. Once more he may retire to his home at Lynn, but no one can imagine him as inactive. — On November 7, Theodore Horton came up from Sandwich on Cape Cod, where he has lived since being retired from the service of the State of New York, and spent two hours or so at the Institute. He came primarily to consult regarding the entrance of Technology of his stepson, now in the service, but also spent some time with the Secretary. We had a grand reunion, going back to days in the bacteriology lab of our fourth year and coming down to the present time. We discussed our cardiac disturbances with almost the abandon of old ladies comparing their operations and talked of our hobbies as well as our past careers. Horton is a collector and has a splendid collection of paperweights, Sandwich glass, and so on, many pieces being of unusual variety and value. In addition to living the life of a retired engineer and a connoisseur, Horton has been as active and helpful in community affairs, especially during the war years, as his health has permitted. It was a great pleasure to have the opportunity to strengthen a long-standing friendship.

Two recent chance meetings with George Owen have brought news that he is engaged on problems of reconstruction and reconversion of ships, working as an inspector for the Army at the plant of the Simpson Shipbuilding Company at East Boston, a division of the Bethlehem Steel Company. His long experience in the practice and teaching of naval architecture fits him admirably for this service. Since our last encounter, the distressing news that his wife has suffered an attack which requires hospitalization has been received. George's many friends will certainly sympathize most sincerely and hope for Mrs. Owen's prompt recovery.

A new address has been received for William E. Parnall, who was associated with our Class in the Department of Electrical Engineering. His address is now 15 Hazlewood Avenue, San Francisco. Rev. Francis M. Adams has also recently changed his address from Ridgefield, Conn., to Sabattus, Maine, R.F.D. No. 1. John N. Ferguson seems to have decided to spend his advancing years in sunny Florida, his address being 853 Northeast 81st Street,

Miami. Any member of the Class visiting that enterprising city would doubtless find much pleasure in calling on John. Jim Kimberly is back once more at his former address, Tryon, N.C., after an extended residence in Washington. The Secretary wonders whether he has separated himself permanently from his old home in Neenah, Wis., and the Kimberly-Clark Company, in which he and his sons have so long been active in administrative positions.

We seem to be doing fairly well on the Alumni Fund and hope we can match last year's record. — SAMUEL C. PRESCOTT, *Secretary*, Room 3–233, M.I.T., Cambridge 39, Mass.

1896

On the expectation that a grand alumni celebration will take place in Cambridge on Saturday, June 8, the Secretary has been corresponding with G. M. Leghorn, the present manager of East Bay Lodge in Osterville, to explore the possibilities of having the Class celebrate its 50th anniversary in Osterville on the two or three days preceding June 8, and then going to Boston to participate in the grand celebration on Saturday. Further developments will be reported in later issues.

At the request of Father Partridge, a list of names and addresses of classmates has been sent to him, and classmates undoubtedly have received his appeal for financial assistance toward furnishing his new trailer to replace the one that was burned last year, all being a part of Father Partridge's plan to embark on another mission trip in the trailer to the South and West. Partridge has sent the Secretary a set of fine photographs taken on the occasion of his last trip to Alaska and also a copy of a paper of his in which the proposal is strongly urged that consideration be given to the fine opportunities for postwar employment for veterans in Alaska, especially along agricultural and mining lines.

The Washington, D.C., *Times-Herald* of October 1 contained a featured article on our classmate W. E. Haseltine and his etchings, which, as an exhibiting amateur artist, he had entered in the *Times-Herald's* eighth annual Art Fair. The etchings were completed on a trip to Guatemala a few years ago. Colonel Haseltine also has a collection of etchings made several years ago in Central America. The Colonel is seemingly carrying out the rule for longevity that a man when retired should continue to keep busy. He must be having a busy life in Washington with his etchings and his war work, begun after retirement from his business operations in Ripon, Wis. As soon as his war work is completed, he and Mrs. Haseltine plan to resume their hobbies of travel and etching. The immediate objectives of their next tour are the Southwest and Mexico.

On October 27 the Secretary attended a meeting of the Portland, Me., club in Augusta and afterward returned to Portland to spend the night at the Hotel Eastland. An unsuccessful effort was made to get in touch with Elmer Robinson, our classmate, who makes his headquarters at the Eastland; but unfortunately Rob had gone to Bangor to see a friend and also to attend a Knights Templar commandery inspection, so that there was nothing for the Secretary to do but go to bed. The next day, Sunday, October 28, the Secretary had another pleasant dinner visit with Charlie and Bertha Tucker in North Andover. The Tuckers were planning a trip to Bermuda, leaving early in November. Charlie's apple orchard had a very low yield this summer, so that it was no real chore for him to pick and dispose of his apples. His peach crop was also light, and, as a matter of fact, he had the peculiar experience of selling what peaches he had and then being obliged to go into the market to buy peaches for Bertha to can. Charlie had disposed of his dairy herd a few years ago, but the war created a situation which called for special action. It seems that Charlie is very fond of butter and consumes it liberally, and when the local supply failed, he had recourse to the purchase of a cow, which gave milk, and from which milk the cream was skimmed and made into butter. That, in turn, created a skim-milk problem, and Charlie had to take further steps and purchase a pig to eat the skimmed milk. However, the result is going to be most satisfactory, as he will ultimately kill the pig and secure a plentiful supply of pork to be put down in his deep-freeze cabinet, already well stocked with edibles.

Henry Tozier has reported that after a very pleasant summer stay at the Hotel Weldon in Greenfield, Mass., he and Mrs. Tozier had a short sojourn in Rochester, N.Y., where he lived for so many years when connected with the Eastman Kodak Company. They planned to leave on November 12 for Florida by automobile, and, after touring that state more or less and making short stays at a number of places in the central and West Coast districts, to arrive on December 28 at Neptune Hall, Bahama Beach, Melbourne, Fla., to stay for the balance of the winter.

Recent correspondence with Joe Pillsbury in Vancouver, B.C., although pleasant, has not really developed any news, except that Joe is apparently pursuing his peaceful life on his retirement basis. Dan Richardson, who has in the past spent winters in Florida and run bungalow camps on Lake Winnipesaukee in the summer, is located this winter at 26 Jefferson Street, South Braintree 85, Mass. A pleasant surprise came to the Secretary one afternoon in the form of a call from Fred Rundlet, who is now re-retired and continuing to live in Cambridge. After retirement from his long service in the Custom House, he had been called back to serve during the war. His call permitted a most pleasing exchange of reminiscences of our school days at Technology, and he left with the promise to come again soon.

The passing of another classmate is noted in the death of Albert D. Hatfield, which occurred last January. He was with us in our freshman year and was also a student at the University of Pennsylvania, taking special work in chemistry. From 1896 to 1907 he was treasurer of the Wellman, Seaver, Morgan Company, but since 1907 he had operated an important life insurance agency in Cleveland under the name of A. D. Hatfield Agency. He was a 32d-degree Mason, a member of several Cleveland clubs, and past president of the Cleveland Life Underwriters Association.

The Secretary feels that it is now time to serve classmates with another of Bob Flood's interesting stories, as follows: "There was a man who attended Technology with our Class, and also attended Yale — James Clayton Russell, after whom an American Legion Post was named. He was born on December 28, 1873, son of Martin J. Russell of Chicago. Martin J., the father, was editor and part owner of the old Chicago *Chronicle*, collector of the port at Chicago, and a personal friend of Grover Cleveland. President Cleveland appointed Mr. Russell on a civilian committee to report on West Point. Mr. Russell took Jimmy with him, and Jimmy was sold on West Point, the Army, and everything military. But Mr. Russell had other plans. Jimmy was to be an engineer, hence Boston Tech and Yale Scientific. West Point never got Jimmy Russell. I don't know what the engineering fraternity lost. Jimmy's heart was in the Army. His spare time was given to drawing pitched battles, war equipment, and parades. He went into the journalistic field in Chicago and after the war did publicity work. When World War I came along, that was Jimmy's chance. He climbed into an officers' training camp and was commissioned. He was war correspondent at Fort Sheridan, later at Rockport. As a captain, he attended the Army College, Washington, D.C. He was a member of the War Plans Division, General Staff, Military Intelligence Division, and censor of official shots and moving pictures. Organizations: Black Hawk Post (the name of which was afterwards changed to James C. Russell) past commander; Combat Medal Men's Association, of which he was organizer. A Boy Scout medal was named after him. He died on October 11, 1931, and was buried with full military honors. When Jimmy was in Boston, he ate at Mrs. Bourse's, where I lived, and spent a good deal of time in my room. He read my Baedecker till he knew more about London and the British Isles than I did. And I'd been there a year. He was a bear for work and a stickler for form. I learned a lot of English from Jimmy, scanning the dictionary for words that sounded like what I wanted to use and then springing them on him to see him shudder. One time the washerwoman brought my laundry to my room with a bill. Jimmy illustrated the bill. The shirts looked as if they had been bombed; the underwear, as though it had been targets on a rifle range; and the socks, shell-holed. If I had known Jimmy Russell was going to be as prominent as he turned out to be, I'd have saved that laundry bill. Wish I had anyway!" — CHARLES E LOCKE, *Secretary*, Room 8–109, M.I.T., Cambridge 39, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge 38, Mass.

1898

The following letter has been received from Bob Allyn: "As Ed Chapin seems to think you want some grain for your mill, I thought I'd send you a summary of my 12 years of city service, since I go back to patents in December. I came to New York in 1900, intending to stay two years. Then the National Guard got me in 1903 (in spite of Captain Bigelow's example). This was followed by the war and the Reserve, for 20 years, then a little politics — and I've been here ever since. The administration of sanitation intended for six or eight months proved most interesting and led me after two years to the Dock Department and

eight years' supervision of Foreign Trade Zone No. 1. We have fully demonstrated the wisdom of Foreign Trade Zone procedure in spite of great opposition from private warehousemen and a halfhearted attitude in the Treasury Department. A believer in the protective tariff system, I have been educated almost to free trade — at least I should try to give the importer and exporter a fair break (not contemplated by the customs laws). We have succeeded in bringing to New York the international trade in Sumatra tobacco and keeping it here in spite of the difficulties incident to the war. You may have heard of a liquor shortage — but you should see the tens of thousands of barrels of various brands stored in the Zone for ultimate consumption! We did a big business in Argentine tinned beef until our Federal relations became too hot. We have handled over 20,000 lots of over 280 kinds of merchandise from over 70 countries, weighing 630,000 tons and valued at over $320,000,000. New York is a natural vestibule for the commerce of the world. The Zone is an ideal place to bring your goods for inspection, sampling, reconditioning, and storage while you are determining whether to import them or to ship them to a more favorable market. I was surprised to learn the other day that Technology had a professor of marine transportation (Professor Lawrence B. Chapman). More power to him.

"During the war, for about three years, I doubled as Civilian Defense aide, working with the police and various civilian defense agencies, inspecting drills and planning procedure for handling unexploded bombs. As personnel officer, I processed reports to the Federal Security agencies of over 500 accidents to Civilian Defense workers and claims for injuries incurred. My four children are all married, and I have 10 grandchildren. In my spare time I've written a couple of digests on plant patents and digests of Supreme Court patent decisions and on patentable invention. The Supreme Court, in one of my cases referred to as the 'Cuno case,' handed down a decision which created a good deal of stir in the patent law world by a statement backing up my contention that the invention at issue did not embody any spark of creative genius. This idea was not new, but many people seem to think it established a new standard for invention. I still believe in the Constitution and free enterprise and hate the Raw Deal. And last but not least, my son, Robert H., has resigned from the Army as a captain after five years of service."

The following letter has been received from Roger Babson: "Your request for a letter from me to the Class of 1898 has been received. During the war, I have been busy helping train over 2,000 naval officers for supply work (which includes buying, accounting, and so on) and helping Army Engineers make duplicates of over 200 sections of our great United States relief map. These sections cover the leading United States airports and weather stations. All the above work has been done on the campus of the Institute here at Babson Park. Let me add that any who have not seen this great map (the largest and most accurate in existence) should come out some Sunday afternoon, when it is open freely to the public.

"As to the future outlook, about which you ask, for two or three years general business should be good, accompanied by still higher stock and real estate prices. What will happen around 1950, after people have spent their present available cash, is another question. If the entire world is then suffering from unemployment, we shall pull through again, as we have in past depressions, with the aid of more inflation stimulants. If, on the other hand, Russia and the Communistic nations then have no unemployment, while the United States has 20,000,000 unemployed, a real revolution may take place here in America.

"In view of the above uncertainty, I am urging my grandchildren, my Babson Institute students, and the children of my clients to become *experts* in some one line of business or profession. Those who are qualified as experts in accounting, foreign exchange, distribution, or production have nothing to fear. They, however, must concentrate on some one industry or commodity so as to be able to qualify by competitive examination. Young people who expect to live on inherited money, or be security salesmen or automobile agents, or otherwise 'live by their wits,' may be out of luck. Atomic energy will raise the standard of living for the masses of every nation."

Accompanying this letter were circulars, one describing the construction and the history of the map, its location, and how to get there, and another telling how the map has saved the lives of many American aviators. Roger also says that a Technology Club has been started in Wellesley. One new address has come in: Ashley B. Whitmore, 1054 Croyden Drive, Dayton, Ohio. The Secretary takes this opportunity to wish the members of the Class a very happy New Year and to remind them of our coming 50th reunion. — ARTHUR A. BLANCHARD, *Secretary*, 187 West Chestnut Avenue, San Gabriel, Calif.

1899

Mrs. Sylvester Q. Cannon has kindly provided me with the memoir of our classmate, Sylvester, published in the *Transactions* of the American Society of Civil Engineers soon after his death on May 29, 1943.

Sylvester attended the College of Latter-Day Saints and the University of Utah before entering Technology. Graduated with our Class in the Course in Mining Engineering, he served his church for three years as a missionary in the Netherlands and Belgium. He also made a journey to Palestine. Soon after his return to the United States, he was married to Winnifred Saville. They had four sons and three daughters, the two youngest sons being in the service of the United States at the time the memoir was written.

Sylvester began the practice of mining engineering in 1902. From 1905 to 1907, he was in charge of hydrographic and irrigation surveys of the Weber River system in Utah, under the direction of the state engineer. A second time he went to Europe as missionary of his church from 1907 to 1909. On his return he went into hydraulic and irrigation engineering practice and in 1912 was employed by Salt Lake City to look after its complicated water supply. A year later, in April, 1913, he was chosen city engineer, serving until August, 1925. In this capacity, Sylvester was in charge of all engineering and construction, including water supply and water system, sewer construction and maintenance, 60 miles of street pavement, construction of sidewalks, smoke abatement work, and city planning and zoning. Some $11,000,000 was spent under his direction.

During his employment by Salt Lake City, Sylvester arranged many water exchanges with farmers. The farmers, inheriting rights to the mountain streams, which were so well suited to culinary purposes, accepted in exchange water from Utah Lake which was equally suitable for irrigation. The city had acquired the lake water during the days of Brigham Young to provide means of transporting stone through a canal from the mountain quarry for the construction of the Salt Lake Temple. The coming of the railroad made the canal unnecessary, but the water rights acquired were very valuable to the city for exchange purposes. As city engineer, Sylvester approved the design and supervised the construction of the Mountain Dell Multiple Arch Dam for the reservoir in Parley's Canyon (reinforced concrete, 140 feet high, 610 feet long at the top) and designed and supervised the construction of the Lake Phoebe-Mary Dam (60 feet high and 330 feet long) and the Twin Lakes Dam (72 feet high and 650 feet long) — all for the storage of culinary water for the city.

In 1933 he was one of the three members of the advisory board set up by the Federal Government through the Public Works Administration to scrutinize and pass upon all state, county, and municipal projects in Utah for inclusion in the $3,300,000,000 Federal fund for public works. Sylvester was a member of the Sons of the American Revolution and of the Timpanogos Club. In 1914–1915 he was president of the Utah Society of Professional Engineers. He had been a member of the Chamber of Commerce and devoted much time to city planning. From May, 1913, to October, 1925, he was chairman of the Board of Canal Presidents, supervising and directing the Utah Lake Pumping Plant and distributing water to the five main canal companies that supply the irrigation water for Salt Lake Valley. From July to September, 1923, Mr. Cannon acted as consulting engineer for the United States Reclamation Service on public improvements for the new town of American Falls, Idaho.

In June, 1925, an important change occurred in his life when he was chosen by his church to be its presiding bishop. (This officer has large responsibilities in the temporal affairs of the institution and is one of its general authorities.) Sylvester's engineering, as well as his missionary and other spiritual background, was an asset to him in his work. Supervision of buildings, their construction, and other obligations took him through most of the western United States. Administrative work brought him in close contact with highly varied activities.

Sylvester was president of the board of trustees of the Dr. Groves Latter-Day Saints Hospital at Salt Lake City; the Dee Hospital at Ogden, Utah; and the Idaho Falls Hospital at Idaho Falls, Idaho — all church-owned. He was also president of the Latter-Day Saints Business College, Zion's Aid Society, Deseret Gymnasium,

McCune School of Music and Art, Radio Service Corporation of Utah (KSL), and Deseret News. He was treasurer of the Uintah Basin Construction Company, supervisor of Salt Lake County Drainage District No. 2, director of Zion's Coöperative Mercantile Institution, Zion's Securities Corporation, Utah Hotel Company, Amalgamated Sugar Company, and United States Fuel Company. By appointment of the Governor of Utah, he was chairman of the special state flood commission (September, 1930, to February, 1931) and of the state advisory council for unemployment (August, 1931, to January, 1932). In April, 1938, Sylvester was chosen assistant to the Council of Twelve Apostles and in October, 1939, one of the members of that council. In the discharge of his new duties he traveled throughout the United States and also in Hawaii and in Europe.

Edwin Bergstrom, IV, formerly of Washington, D.C., is now located at 3757 Wilshire Boulevard, Los Angeles, Calif. — Burt R. Rickards, *Secretary*, 381 State Street, Albany, N.Y. Arthur H. Brown, *Assistant Secretary*, 53 State Street, Boston 9, Mass.

1900

Letters have lately been received from Osgood, Crowell, and DeWolf; indirectly news has come in of Everett, Hart, Sperry, and Draper; also, the Secretary has met on the street Harry Learnard, Burns, and Leary. Ziegler relates that at South West Harbor in Maine this summer he met Sperry and together they called on Phil Ripley. Dick DeWolf writes in: "Thanks for the account of the reunion and the photograph. It was a very worth-while occasion, and I'm glad I came. I stayed on at East Bay Lodge until July 17, then returned via New York. I hope any of the fellows coming down will find time to get in touch with me, either here at 23 Second Street, North East, Washington 2, D.C. (Phone FRanklin 4293), or at the Cosmos Club, where I usually lunch."

What a thrill to receive this fall from Crowell, the cranberry king, a box of his luscious berries, as reminder of the punch he mixed last June. At the Alumni Council meeting in October, the Class came through with a full table. Those present were Ziegler, Allen, Smith, Fitch, Russell, and the Secretary.

Tweedy writes us in part as follows: "About 20 years of my life I spent in old Mexico in mining operations and consequently have had very few contacts with Technology men in past years. I want to take this opportunity to extend to all the fellows my best wishes and kindest remembrances. I have four children — three girls and a boy. The three girls are married, and I have five grandchildren. My son, George, Jr., is a lieutenant with the Marine Corps and is in their air warning service as a radar officer. Fortunately, we have all enjoyed excellent health for the most part. I have been a widower for the past 10 years. During the last three years, I have been living in Phoenix, Ariz., and occupied as a supervising engineer for the Reconstruction Finance Corporation."

Tom Perry, as interesting as ever, writes: "Your report of the meeting and photograph are very fine; Mrs. Perry and I have read them with much interest. Somehow the boys seem to look older than your humble servant feels he does, and there must have been defects in the lens, for the tops of many heads seem a bit blurred. We were indeed sorry not to get up to the reunion and will try to make the half-century gab fest; but that is too far ahead for even Charlie Smith to guarantee train service on the Cape without crowding.

"The Perry family has been enlarged these last few years, from a pair of sons and a daughter, by adding two daughters-in-law, a son-in-law, and four grandsons. These make an even dozen in all. We had them all here over July 4, except the daughter's husband, who is in Europe. Two of the girls live in town with their babes, so we have youngsters all over the place and get great joy out of it. The daughter's husband is in charge of pathology at the 36th General Hospital, now near Paris; the youngest son is in the Navy, an operating-room technician at the Philadelphia Naval Hospital; and Bretton (M.I.T.'33), is assistant engineer in the machinery division of the American Can Company at New York City, and their work is over 75 per cent for the military. The wife is still managing to manage me with much satisfaction for the recipient and doing it very graciously indeed. Being grandparents is quite an experience, and from Stan Fitch's picture we appear to be mere novices at the game. With a mental twinge it comes home to me that maybe in the next 10 years I'll be approaching the retiring age, but there is lots of work yet to do, and I am just beginning really to enjoy it. It looks as though there might be trouble in getting in all that I feel must be done. My publisher wants more books on woodworking to add to the two that are now out. Philatelic pursuits are likewise very entrancing and call for much interesting study and writing. I notice that one of our classmates, Karl Burroughs, is attaining some philatelic prominence.

"Burt, you don't get half the credit you deserve for the class secretaryship, which you have filled so acceptably for lo! these many years. It's a tedious job, and I'd be in favor of voting you a generous salary from the class treasury, when and if. To help pad the class treasury, I am enclosing a check which should be deductible from taxable income for such an educational project as our golden anniversary reunion!"

Bob Leach writes: "Our backlog of war orders and shortage of man power keep us all at the grindstone at Handy and Harman. It seemed to me that at the 40th reunion some of the Class showed marks of advancing years. Perhaps Paul de Kruif's new book on the male sex hormone and his own experiences with it may be a guide for us all to prepare for the 50th reunion so that we may appear as 'gay young blades.'"

Dr. Francis C. Lincoln has been appointed state mine inspector for South Dakota. He was formerly associated with the Bureau of Mines as examining engineer for the Black Hills region, having been transferred by the bureau from Platteville, Wis., to Rapid City, S.D., on July 15, address 613 Quincy Street. — C. Burton Cotting, *Secretary*, 111 Devonshire Street, Boston 9, Mass.

1905

A letter from Walter Bent in London states that he is returning to the United States "for good" early in 1946 and wonders if I can help him find a place on the shore in Connecticut to settle down. In appreciation he agrees to attend the next class reunion. Already our committee on real estate is working on the case, and we expect to have Walter all fixed up soon.

Horace J. Macintire, II, blew into Boston on November 13, and we succeeded in getting together Donald, Buff, Strickland, and Loughlin for an informal luncheon at the Chamber of Commerce cafeteria. Horace hadn't changed as much as some. He was on a sabbatical year leave from the University of Illinois, where he had been for some years professor of refrigerating engineering. His only son was graduated from West Point last June and is now "somewhere in Germany." Our hurried efforts to get the gang together resulted in discovering that Doc Lewis' son, Clay, is now on the Chemical Engineering staff at the Institute. This was Horace's first trip to Boston after sojourning for some years in Pittsburgh and in the states of Washington, Idaho, and Illinois.

Finding it necessary to go to Philadelphia on business, on November 15, I got in touch with Roy Walker and Ben Lindsly, and they arranged an '05 dinner at Alden Park Manor. Fifteen were present, including Mr. and Mrs. Lindsly, Mr. and Mrs. Walker, Rev. and Mrs. Caine, Mr. and Mrs. Chesterman, Mr. and Mrs. Ray White, Mr. and Mrs. Blakeman, your Secretary and wife, also Claude Anderson. I had with me films taken at the 25th reunion at Osterville and the 35th at Old Lyme, Conn., which were much enjoyed, as most of the party had never seen them. Lindsly is expecting to move on, as the Securities and Exchange Commission will probably shortly move headquarters back to Washington. Anderson is operating "on his own," still specializing in ventilating engineering and allied lines. Roy Walker is still with Lanston Monotype, after a stretch of more than 40 years, but the fact that he has just bought a farm in northern Pennsylvania, which Mrs. Goldthwait and I visited, indicates a forethought of leisure (on a farm?). Anderson invited us all out to Norristown to hear Rev. Caine pontificate. Ray White has been plenty busy during the war years, what with his abrasives business and his factories in Canada.

Failing to secure Blakeman's history orally, I got him to write it, as follows: "I was out of shipbuilding for several years and in the insurance business, and from early 1935 to early 1939 was budget director for the State of Maryland. Afterward, I returned to my insurance business for a short period; but the old desire to get back into shipbuilding drew me to the Maritime Commission early in 1941, though I still maintained my residence in Baltimore. In May, 1942, the Commission decentralized its construction control into four regional offices; and the writer, along with others, was assigned to the Philadelphia office, in charge of ship construction on the East Coast. We set up shop at 1015 Chestnut Street. The outfit included inspectors, a vessel acceptance squad, a trial board squad, construction auditors, disbursement auditors, cost review men, material control men, and a few lawyers and other evil individuals necessary to such an organization. The commission, meanwhile, maintained its headquarters in

Washington, supervising over-all policy. This is still the setup. The cancellation of some of our wartime program has made it necessary to reduce our inspection force and other sections somewhat, but this is more than offset by the increase in contract termination and surplus material disposal, so that we now have, in the Philadelphia region, nearly as large a force as at any time during the last four and a half years. My position now is that of assistant director, in charge of the Philadelphia office, and hence of the East Coast area, coming under a director of construction who reports to the commission. The director of construction visits us for about a day or so a month, and so far has found things run in such a fashion that he doesn't seem to need to come back for another month."

We have just learned that Robert Bixby, for a while with Course II, died "some time ago." He was with Davis and Furber Machine Company in North Andover for a while, and I have asked Henry Stevenson, who has been there a long, long time, to get further data.

Louis Robbe writes that only 18 men have responded to his offer to send 24 splendid prints of the 40th reunion at Old Lyme last June for $2.00 — a surprise, because Louis has worked hard to assemble these prints, identify faces by number, and group them in an attractive manner. They really are good, and you who do not know how the callow youth of 1905 looks in his 60's should send two bucks to Louis; address — Louis E. Robbe, 108 Hickory Grove Avenue, Larchmont, N.Y. The pictures really are good. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston 10, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 71 Newbury Street, Boston 16, Mass.

1906

These notes, written on November 26, are for the January, 1946, Review. It should be unnecessary to remind readers that 1946 is a significant date in the history of the Class in that it should be the occasion for a five-year reunion. In deference to those readers who do not like to be reminded of the passing of the years, we shall leave it to them to apply the necessary mathematics to determine the numerical prefix to be associated with this year's reunion. All we can say at this time is that it is our firm intention to arrange a reunion to take place, the location still to be determined, and the time to be a week end in the early part of June. Make plans now to attend, and more definite information will be provided as soon as the plans crystallize. If any one has suggestions in regard to the reunion, the Secretary would be pleased to receive them.

Only two items of class news have come to the Secretary's attention. Carroll A. Farwell, I, who is one of the partners in Fay, Spofford and Thorndike, a Boston concern of consulting engineers, is serving as secretary of the Engineering Societies of New England.

The Secretary's office has forwarded notice of the death of Alfred W. Hertz, who passed away on March 31. Hertz was an architect and was practicing his profession in New York in 1913. In 1915, he moved to Kansas City, where he resided at the time of his death. In 1935, he was with the United States Engineers' Department at Fort Peck, Mont. — JAMES W. KIDDER, *Secretary*, Room 801, 50 Oliver Street, Boston 10, Mass. EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills 82, Mass.

1907

A miniature class reunion took place in my office at Whitin Machine Works on the afternoon of October 30. Phil Walker, who is maintenance engineer at this plant, walked in with Gilbert Small in tow, and shortly afterwards Phil's assistant appeared, bringing with him Howard Chase. So there were four '07 men together for a very pleasant few minutes. Gilbert, who is senior partner in J. R. Worcester and Company, Boston, engineers and contractors, had just come from inspecting progress in the construction of a new factory for Wyman-Gordon Company of Worcester at North Grafton, which is near Whitinsville, and called in to say hello to Phil and me. His firm is busy on jobs ranging from bridge and factory repairs and building to remodeling and repairs on churches. Gilbert still carries on his hobbies of raising small fruits and bees at his home in Wayland, Mass. Howard Chase has recently been promoted to be general manager of Tower Iron Works, of Providence, R.I., with which firm he has been connected for many years as contracting engineer. During that time he has spent many hours at Whitin Machine Works, as his company has done a great deal of structural steel work in new buildings and renovations at the Whitinsville plant.

Byron P. Luce, about whom we wrote at length in the July Review, has returned to South America, his address now being Hotel Alferey Real, Cali, Colombia. — Rutherfurd Bingham, who has lived at Newtown, Pa., for many years, is now at the Hotel Vendome, 160 Commonwealth Avenue, Boston. — William A. Young sold his hardware store in Exeter, N.H., that he had maintained for many years, in July. He is now vice-president of the Exeter Banking Company.

Many of you will remember John Mather, who was with us during our freshman year, coming from Lowell, Mass. I now quote from a press release from the Army Service Forces, Ordnance Department, Watertown Arsenal, Watertown, Mass., dated October 30: "Colonel John Mather, Commanding Officer of the Watertown Arsenal during World War II, will retire from active service in the near future. He came to the arsenal on June 1, 1938, as production manager and was designated commanding officer on November 4, 1941, just before Pearl Harbor. During his tour of duty at the arsenal, Colonel Mather completely rehabilitated all the buildings and retooled and modernized the shops for the tremendous war orders. He instituted recruitment and training programs for the force of employees, which expanded from 700 to a peak of 10,000, which so produced the huge quantities of gun carriages, shells, and a variety of ordnance that the arsenal was given the Army-Navy award for high achievement in production five times. Also during that period he greatly enlarged the Ordnance Department laboratories in personnel and scope of activities so that they became a vital source of information to the armed services and industry generally for the development of superior fighting equipment for troops in the field. Never before in its long history of service to the Army since its founding in 1816 has the Watertown Arsenal supplied the quantity of arms it did during the recent war, surpassing the most hopeful plans made for it. Colonel Mather is a native of Lowell, Mass., and entered the army in 1908 in the Coast Artillery Corps. He was promoted to the rank of lieutenant colonel during World War I and served 16 months in France as a heavy artillery officer on General Pershing's staff. He transferred to the Ordnance Department in 1920 and has since served nine years in the office of the Assistant Secretary of War in the field of procurement planning, and six years as a production manager at manufacturing arsenals of the Ordnance Department before commanding Watertown Arsenal. He attained the rank of brigadier general in 1941 and was retired because of statutory requirements in 1943, but was returned to duty immediately in the same position as commanding officer of the arsenal."

The Boston *Post* of November 4 has the equivalent of a three-column article about John and the arsenal work under his leadership, from which I quote at random: "The arsenal, because its chief mission was the making of antiaircraft guns and coast artillery, had one of the most difficult problems of any production unit, for immediately after Pearl Harbor the great and pressing need was for antiaircraft guns. . . . Watertown Arsenal under Col. Mather swung into action. Right off the streets 3,000 people were taken and trained at nine trade schools in Boston. . . . In eighteen months 5,500 persons were added to the payroll. . . . In the spring of 1942 women were put to work using cranes and heavy machines. . . . The 90 mm. antiaircraft gun was designed and developed at Watertown, peak shipments for it being reached in March, 1942. Even during its manufacture improvements in design were introduced, all without loss in the production program. . . . The big siege gun, a 240 mm. howitzer, used in Italy, was manufactured also at Watertown, and in May, 1944, the arsenal was ordered to produce shells for it, as well. This order necessitated a complete new setup, including sixty major tooling machines and a new conveyor system. Within six months shells were being produced and by March, 1945, maximum production rate was attained. This shell weighs 360 pounds. . . . The largest gun made in the United States, the 16-inch coast artillery weapon, is manufactured at Watertown. It hurls a 2,340-pound shell 28 miles. Before the recent war 730 days were required to make one of these. The wartime schedule cut the number of days to 47. . . . Much of the time saved was due to the centrifugal casting process which was developed at Watertown. In 1938, 15 employees were making guns by this method. In 1941 the number had increased to 96, in 1942 to 288, in 1943 to 550. During 1938 one casting machine ran eight hours a day, five days a week. In 1943, 14 machines ran 24 hours a day, seven days a week. . . .

"The arsenal had a very active safety organization sponsored by Col. Mather. The safety record went from the lowest of all arsenals to the highest during the war. He took a keen interest in all employees. He established an industrial relations de-

partment, something that never existed at the arsenal before. He was instrumental in setting up a cafeteria that fed as many as 8,000 persons a day. . . . The arsenal was the first plant in the country to receive the Secretary of War's flag for participation in the War Bond program — in fact, there has been only one other award of this flag. To win this honor at least 95 per cent of the employees must purchase war bonds to the tune of 15 per cent of the total payroll and hold this percentage for at least three months. The arsenal produced 99 per cent of its employees for 15.5 per cent of its payroll and held it for nine months — the highest record of its kind in the country. During the final week of the Seventh War Loan drive Col. Mather played and won a unique cribbage match at the arsenal. Admission to the match, played with an official at the arsenal, was the purchase of a bond. A board placed on the wall enabled the audience to follow the score, five games being played. The match netted $40,000 for the drive."

John says that this time his retirement "will take." He was retired on September 30, 1943, by law, but reported as a retired officer the next day. As a matter of fact, he never left the arsenal. He will make his permanent home at Cotuit, Mass. The Boston *Herald* of November 8 tells of his being presented with the Legion of Merit on November 7 for his work in developing mass production methods in artillery material. — Bryant Nichols, *Secretary*, 23 Leland Road, Whitinsville, Mass. Harold S. Wonson, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1908

The first meeting and dinner of the season was held at the University Club in Boston on November 13. Although the weather wasn't too good, 12 of the faithful showed up: Stiles Kedy, Linc Soule, George Belcher, Sam Hatch, Toot Ellis, Myron Davis, Harold Gurney, Linc Mayo, George Freethy, Doc Leslie, Nick Carter, and Joe Wattles. Following the plan of last season, we had dinner in the Club Grill and then adjourned to Room 304 for our meeting, where news of various classmates was talked over. Harold Gurney showed us some fine Kodachromes which he took last fall in New York State "Along the Mohawk," also pictures taken in the Canadian Northwest. We hope at our next meeting, on January 15, to show some colored motion pictures.

Linc Soule has become a grandfather again. Dick Collins' daughter has announced her engagement, and his son is back in this country from Italy. Dick has also become a grandfather. Linc Mayo told us that although the Class still has a bank balance it is decreasing; hence payment of dues is in order. I had hoped Cookie could have been with us to tell about the Alumni Fund, but he couldn't make the dinner. If any of you haven't sent in your subscriptions, please do.

Jim McGowan very kindly sent us the following news published in the North Adams, Mass., *Transcript* last fall: "Former Selectman and Superintendent of Streets Hubert W. Flaherty, a Japanese held prisoner since the capture of Guam shortly after the Pearl Harbor attack on December 7, 1941, has been liberated and his physical condition is good, according to word received by his sisters. Earlier, Mr. Flaherty's wife, who now resides in Geneva, N.Y., had received a message from the State Department saying that he had been liberated and 'his physical condition is good.' No further details as to when he might be expected home were revealed. Mr. Flaherty resigned as Superintendent of Streets in Adams in May 1941 to accept a position as civilian aide to the governor general of Guam. He had been on the island only a brief time when it was captured by the Japs and he was taken to Japan as a prisoner. He was at the Kobe prison camp when last heard from in a letter dated May 16."

The following from the New Orleans, La., *Item* will be of interest: "James T. Gallagher has arrived at U. S. Maritime Commission headquarters here to assume his duties as assistant regional director of construction for the eastern region. Mr. Gallagher is a shipbuilder of long experience, and during World War I was production engineer for the Lake Torpedo Boat Co. at Bridgeport, Conn. In 1937 he joined the Maritime Commission as a naval architect but was soon assigned to production as assistant chief."

We were sorry to learn of the death of Harold Locke, who, you will remember, wrote one of our Tech Shows. We quote from the Boston *Globe:* "John H. Locke, retired vice president of the General Steel Castings Corporation, died November 12th at his Bryn Mawr, Pa. home. . . . He was a member of the board of directors of the Real Estate Trust Company." — We were also sorry to learn of the death of Cliff Boylston in a letter received by Doc Leslie from Cliff's wife. He died on October 13 as the result of an automobile accident which occurred in December, 1944.

The second get-together meeting and dinner of this season will be held at the University Club, Trinity Place, Boston, on January 15 at 6:00 P.M. The usual notices will be mailed early in January. Please make your plans now to be with us. — H. Leston Carter, *Secretary*, 60 Batterymarch, Boston 10, Mass.

1909

Those of us who know her at all realize that our most energetic coed, Florence Luscomb, IV, has always devoted herself to activities which looked toward improving the conditions of the human race. At the time of our last report, in July, 1943, she was working on a farm to supply a large family with farm products and was also doing what she could to relieve the deplorable conditions of Spanish refugees. When asked the results, she has replied as follows: "At present most of my efforts, as chairman of the Boston chapter, are devoted to the Spanish Refugee Appeal. After six years in concentration camps, including Buchenwald, only 150,000 Spanish Republicans survive out of the half million who fled to France when fascism conquered Spain. Their condition is indescribable. They are more starved, more naked, more sick, more desperately friendless than almost any other victims of the war. Because their fight against the armies of Hitler and Mussolini was technically not a part of 'the' war, they receive no help from the United Nations Relief and Rehabilitation Administration or the Red Cross. Unlike other refugees they cannot go home, for Franco still has firing squads and prisons for them. They are homeless exiles: the world's forgotten men. The Spanish Refugee Appeal raises the funds to save them from slow death. The actual relief in France is administered by the Unitarian Service Committee.

"My interest in defending and extending democracy and the rights of the common man has made me active in the Massachusetts Civil Liberties Union, of which I am vice-president. It's a hilarious joke that this organization is labeled 'red' by some, in view of the fact that its job is to defend the Constitution and the basic American rights of citizens. Our main activities at present are fighting racial and religious intolerance; defending the rights of citizens to earn their bread without discrimination on account of race, religion, or color; and trying to end the disfranchisement of seven million white and three million Negro citizens solely on the ground of poverty by the requirement of a poll tax as a prerequisite for voting. Personally, I don't see how anyone can look the American flag in the face who doesn't support these measures. What have we been fighting a war about?

"My war service was these battles on the home front for democracy (they refused to take me in a machine shop or the Navy Yard on account of my age) plus food raising for three summers. I think you know that I was a member of the Volunteer Land Corps, working on a Vermont farm one summer. My job was the vegetable garden — a big one — plus canning. The next year I farmed on my own. When I say that, I mean everything except the plowing — including cutting and setting bean poles and gassing woodchucks. I canned between 600 and 700 jars — which doesn't mean a thing to a man, but his wife will understand. Oh, yes, I'm also recording secretary of Local 3, United Office and Professional Workers of America. I'll bet a hat I'm the only officer of a C.I.O. union in our Class. This summer, for the first time since Pearl Harbor, I took a real vacation and spent a month in my little cabin at Tamworth, N.H. The latchstring will always be out there for any member of '09."

Brad Dewey, X, has in no way relinquished his activities since he ceased to be rubber czar and has thrown his weight and influence to the betterment of school conditions in Cambridge, Mass., his home town. The city now operates on "Plan E," under which the city council and school committee are elected by proportional representation. Brad became one of 14 candidates for the school committee, of whom six were to be elected, and Brad, with the backing of the Cambridge Civic Association, came in a strong second. The committee badly needs the type of member exemplified by Brad. On October 9 he was the principal speaker at a meeting of the northeastern section of the American Chemical Society and stated that scientists must make Congress keenly aware of our desires as to labor and the farmer. He was also one of the principal speakers at the 21st New England Conference, held in Boston on November 15 and 16.

Many of us had wondered exactly what Bernard Fuller, I, had been doing these past few years; hence we were more than pleased to receive the following from the

United States Engineers Office at Buffalo, N.Y.: "Since you and Paul Wiswall are so insistent, I'll break down and give you the low-down on my activities. It seems that the United States Engineer Department had some dams to build up here and sent some scouts to the Tennessee Valley Authority, which has made quite a record in building dams. As our program of construction was about over and nearly everyone was wondering where to go next, I decided to try my luck here. I haven't regretted it, although it has been hard work getting a dam planning organization under way during a time of such shortage of man power, to say nothing of the time I had finding a house in this city.

"It was my first move in 10 years, a long record for a Course I man. I liked the T.V.A. very much, and my work in the project investigations section of the project planning division gave me an over-all picture of the far-reaching effect of the T.V.A., which my specialized work in the design department at first had not provided. Whether there will be other T.V.A.'s or not, this one has shown that regional planning can be a success in developing a river valley and raising the standard of living for all its inhabitants, rural and urban. It has also shown that a government agency can be run without bureaucracy, political influence, graft, or incompetence. The morale was the finest I have ever seen in an organization, and I think the structures typify in their strength and beauty the spirit of the authority and all its employees from the humblest to the highest. They were really serving their fellow men and their country, both in peace and war.

"I could go on for pages about the T.V.A., but to appreciate it you must see it; so go down there sometime and have Burrell '13, Colburn '23, Emerson '28, Hare '23, A. R. Holbrook '04, Kimball '94, Slover '21, or Wood '06 show you around. These are only a few of the more than 50 Tech men who were intimately concerned with the authority. When I first went there in 1935, I looked up the M.I.T. fellows and found A. S. Peet, II, a classmate, running a glove factory. We got together and decided to form a club. Sixty men came out to the first meeting, some from as far as Kingsport, nearly 100 miles away. Peet was elected secretary and has held that office ever since. Although most of the 75 members came from the T.V.A., it did not dominate the club. Two meetings or more were held each year until the war, one being away from Knoxville.

"Personally, I have enjoyed life with its high and low spots. I have seen most of this continent and the West Indies; and Mrs. Fuller, a good sport and ingenious wife, has gone along to share the construction camps or whatever there was to keep house in. We have four children, three girls and a boy. Two of the girls are twins. All are now married, three getting married within five months, the twins a month apart. We now have five grandchildren. My son is a chemical engineer with Du Pont.

"Well, Chet, I guess that sums it up. It's a long time since the days on Boylston Street, but I hope to get to a class reunion yet. I expect to take Paul up on his offer to treat to a lunch soon, now I am in this neck of the woods. Best regards to all the old crowd and good luck to you and Paul in carrying on the work of dear old 1909." Thanks, Bernard, the '09 crowd is very glad to hear from you and know that so many M.I.T. men are doing good work with T.V.A. — Paul M. Wiswall, *Secretary*, 90 Hillside Avenue, Glen Ridge, N.J. Chester L. Dawes, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries:* Maurice R. Scharff, 3860 Rodman Street, Northwest, Washington 16, D.C.; George E. Wallis, 1606 Hinman Avenue, Evanston, Ill.

1911

Coincidental with our reaching our class quota of 125 contributors in the current Alumni Fund VI, our enthusiastic and successful Vice-president duplicated his $2,500 subscription of a year ago, so mid-November finds 1911 with 160 per cent already subscribed of its $2,875 quota. Again we thank you, Zeke!

It was decided at the "Seven Come Eleven" class dinner at Walker Memorial, M.I.T., on the seventh day of the eleventh month that the first week end in June, immediately following Decoration Day (Thursday, May 30), will be our 35th reunion dates — May 31, June 1, and June 2 — at a Cape Cod resort hotel to be announced. O. W. Stewart continues as a committee of one to select the best location, and a general mailing will be issued about the first of the year. Meanwhile, save those dates and plan to attend if you possibly can.

We had a fine attendance of 23 at the class dinner, and it was particularly good to have two of our servicemen able to be back just in time for the affair and one classmate back in the Hub after 30-odd years in Texas. Colonel Carl Richmond had begun his terminal leave on October 20; Major Ted van Tassel, X, but four days before the dinner; and George Forristall, II, as earlier reported in these notes, is now in Boston with the Harry Frost Company, advertising agency.

In the talkaround, Carl, who has been on active service in fire protection work for the Army since 1941, entertained us for quite some time with personal experiences, contacts with other 1911 men, and a number of now-it-can-be-told wonders of war production. He and his wife and their three boys, 14, 12½, and 2½, are living in Winchester, and he is with the Boston Manufacturers Mutual Fire Insurance Company. He modestly refrained from mention of the fact that on the 30th of October he received notification from the War Department that he had been awarded the Legion of Merit "for exceptionally meritorious conduct in the performance of outstanding service from January, 1941, to August, 1945."

Ted reviewed his more than two years of active service, which began in Chemical Warfare Service, as he had been in World War I. In mid-1944 he was sent to school at Washington and Lee University for courses in orientation and rehabilitation of casualties, was transferred to the Medical Department, and continued from then on in reconditioning work, first at Camp Gruber, Oklahoma, and for the past nine months in charge of the work at Camp Polk, Louisiana. His son is recently back from active service in North Africa and Europe with the Army Air Forces, and his daughter, Nancy, who is living with Ted and Helen in West Newton, has a husband, also in the Army Air Forces, who is still in Japan. Ted is now operating from 14 Parsons Street, West Newton, with a new trade name — Sealed Seam Welt Process, Inc.

George told us how glad he was to be back in Boston, although he and his wife had been hit by the housing shortage and were unable yet to get permanently located. He has two sons, two daughters, and four grandchildren. His older son is a mechanical engineer with Ingersoll-Rand in New York City; and his younger son, a junior grade lieutenant on the destroyer *Stark*. His older daughter is married to an Army Air Forces captain still on active duty; his other daughter is single. He was in advertising throughout most of his Texas stay, except for the past three years, when he has been in aircraft parts production with a former client there in Houston, Texas. He is handling industrial advertising for the Frost agency in New England, and he and his wife are hoping to build a home soon.

We were also particularly glad that Carl Ell, XI, President of Northeastern University, was able to be with us, for he told us many interesting things about the fine record of Northeastern in the war effort and also told us of the expansion plans now well under way. He has a daughter still on active duty as a lieutenant in the Waves, presently engaged in personnel work.

A quick summary of the stories of the "regulars" in attendance reveals the following: Walter Allen, XIII, continues with the A. C. Lawrence Leather Company in Peabody and has one son still in service with the Army Engineers in France in rehabilitation work. Obie Clark is running against quite a labor problem, but is busy now producing a new concrete product — a grave lining, "designed more to keep the dirt out than the body in." Marshall Comstock, VI, still with Wagner Electric Corporation, has two married daughters, three grandchildren, and one son in the service, now in Australia on the cruiser *Birmingham*. George Cumings, VI, with New England Telephone and Telegraph for 24 years, is still single. Obie Denison, VI, is glad to have his older son out on terminal leave and located with his wife in Cornish, Maine, where he has purchased an established printing business, and to have his younger son, George, 21, home from 18 months of foreign service in the Pacific area as aviation machinist's mate, second class, and reporting for reassignment in Boston on November 20; his married daughter and her son, aged three, are still in Worcester, while her husband is in the Army Air Forces on duty at Maxwell Field, Alabama.

Bill Fortune, I, has worked for some time at the Boston Navy Yard. Tom Haines, II, still has the title of superintendent of transmission and distribution with the Boston Edison Company, but is now devoting much of his time to management personnel problems; he has two daughters, each married to servicemen, the younger son-in-law being just out of service. Stan Hartshorn, X, who is still up in Gardner helping people from "cradle to grave" by manufacturing baby carriages, tables, chairs, and sofa beds, like Carl Ell, has a daughter who is a lieutenant in the Waves and a son who left Technology last June in the middle of his sophomore year and is at radar school

at Great Lakes, Ill. Jack Herlihy, II, now a Vice-president of the Boston Edison Company, as previously reported, has a daughter still working at the Institute and two sons in service, the younger wounded but now fine.

Hal Jenks, VI, was present for the first time in many a moon and told us that he is still in the engineering department of the New England Gas and Electric Association, spending most of his time now in southeastern Massachusetts. His specialty is transmission and distribution problems, and at present he is working in Plymouth. His oldest daughter lives with her husband, who is in charge of lens and optical work with a large New York concern, and they have three children. His boy is in the Navy, at present at Pearl Harbor, while his younger daughter is working in a silk mill. The family home is at 54 Elm Road in Newtonville.

Art Leary, XI, who is still teaching math at the Boston English High School, and was married in 1941, has a son two and one half years old. Charlie Linehan, I, still teaching at Rindge Technical in Cambridge, has a daughter now 11. Roger Loud, VI, another Edison stand-by, handling power sales work, was particularly busy through the war; his wife is still busy in Red Cross work in Weymouth; his older son, M.I.T. '42, is now an instructor in the Mathematics Department, while his younger son, wounded last December but back on duty in February, is still with the United States Army in Germany. Charlie McManus, I, still with the Massachusetts Highway Commission, says they are planning $33,000,000 yearly for five years on new highway construction in the state.

Morris Omansky is still in research and development work in the rubber field and has started some evening lecture courses to the engineering students at Northeastern; both his daughter and son are Technology graduates, the former working in an architect's office in Boston, the latter as a chemist in New York City. Walter Phillips, VI, also with New England Telephone and Telegraph, has three sons: the oldest, for two years in the Pacific and when last heard of in Tokyo; the second, a lieutenant commander in the Dental Corps in Washington; and the youngest, also a lieutenant commander, having been in the Navy since graduation from Technology in 1941. O. W. Stewart, I, has four boys all in the service: the oldest, an Army major, just back after hard service in Burma, Korea, and China; the second, a junior grade lieutenant now in Japan; the third, a technical sergeant, also in Japan; and the youngest, a Navy air crew man; he himself is now in his 35th year with the Factory Mutuals, for whom he heads the inspection department, with a staff of 450. Emmons Whitcomb, X, still assistant to the Bursar at Technology, told of an interesting recent trip to Puerto Rico, where he was particularly impressed with the cleanliness of the cities; his son is still in the Navy, presently based at Norfolk, Va., on ferrying service as a pilot. Aleck Yereance, I, who has been out of the service since October, 1944, but was unable to get to the dinner a year ago, is back with the Prudential Insurance Company in Boston; one of his daughters, in the SPARS, married a serviceman last June, and now they're both full Navy lieutenants.

Roy MacPherson, II, sent regrets, adding that he was on terminal leave and expected to depart for Florida "as soon as the boat was ready!" Chester Lawrence Pepper, II, and Mrs. Pepper announce the marriage of their daughter, Emilie Lawrence, to Windsor Smith Carpenter, Captain, U.S.A., on Sunday, the 28th of October at the Congregational Church in Hollywood, Calif. Just before the class dinner, your Secretary learned of Monk de Florez' promotion to the rank of rear admiral in the Navy, and that he had been decorated in early November for his services as director of the Bureau of Aeronautics and as assistant chief of research and inventions — receiving the Distinguished Service Medal. A well-deserved honor, Luis!

Bob Haslam, X, returned in early November after a two-months' survey of the war-damaged European plants of the Standard Oil Company of New Jersey, stating that while war damage to property had been heavy in France, Holland, and Norway, the company's 150-million-dollar war damage reserve will be sufficient to cover it, and the properties will be in operation again in from one to three years. Bob further declared that the need for oil in war-torn countries is second only to the need for food. In Holland, he said, the fuel situation is so acute that the trees along the canals may have to be cut for firewood.

If you missed it, look up that candid shot in *Time* for October 29 of I. W. Wilson, XIV, Alcoa's up-and-coming Vice-president, who made an offer for the purchase of government aluminum plants on behalf of his company. We'll be seeing you in June, Bun! General Kenney, II, in his testimony before the Senate Military Affairs Committee shortly after his Boston trip, doggedly maintained his position in favor of the single national defense department, with coequal arms for air, land, and sea. Minot Dennett, II, when sending in his generous Fund subscription from Detroit, wrote: "Now that the war is over, I presume you will be formulating plans for our 35th reunion. It should be a big turnout. As soon as I learn the date, I will try to make it coincide with my next trip East." Well, now you know, Minot — the dates are May 31, June 1 and 2.

In the New York *Times Magazine* for November 25, the center spread featured three splendid reproductions of etchings by John Taylor Arms, IV, "Sunlight on Stone," "La Torre del Mangia, Siena," and the exquisite "Venetian Mirror." The comment was as follows: "Whenever American printmakers are mentioned, the name of John Taylor Arms comes at once to mind. The etchings for which he is best known are technically flawless interpretations of the great Gothic cathedrals. Examples of his art, covering a span of thirty years and setting a high mark for emulation, are included in the forthcoming exhibition of his work at the Kennedy Gallery. His influence on printmaking extends beyond his own prints. He has been president of the Society of American Etchers almost from its start and he has labored tirelessly to keep graphic work a vital force in American art and life." Ottilie Cushman, wife of Paul, metallurgist with McGill Manufacturing Company in Valparaiso, Ind., recently sent me one of her usual fine letters with interesting clips. There were two or three additions to the Kenneyana, but it was particularly gratifying to have a recent copy of the company's *McGillogram* in which was a really good snap of our Paul and one of the returning vets. Paul was welcoming him back to the company's metallurgical lab, and that winning smile of his was much in evidence.

Believe it or not, the 23d freshman camp was held on November 3, just four months after the 22d of these events conducted by the Technology Christian Association each time a new freshman class enters. Once again it was my good fortune to be present to teach the new class, largely returning vets, Technology songs and cheers.

There are still a few of the faithful who haven't yet sent in their current contribution to the 1945–1946 Alumni Fund. "Leave us not purcastinate," as Archie of Duffy's Tavern would say. May 1946 be full of every good thing for all of you! — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

1912

Frederick W. Barker, X, has recently been elected president of the Syracuse, N.Y., Savings Bank and has tendered his resignation as vice-president of the First Trust and Deposit Company, Syracuse. Barker has been a trustee of the Savings Bank since 1931. His father was president of the Savings Bank for 10 years preceding his death in 1932. From June, 1933, for a considerable period, Barker was on leave of absence from the First Trust, handling wartime duties with the food control division of Lend-Lease in Washington, and returning to Syracuse in December, 1944. For outside interests, Fred serves as president of the Syracuse Museum of Fine Arts. He is also a member of the executive committee of the Excelsior Insurance Company.

Paul M. Tyler, III, has gone to London for some six months as European representative of the Foreign Economic Administration, with particular reference to the operations of the technical industrial intelligence committee in respect to metals and minerals. Mr. Tyler was with the Bureau of Mines for many years and more recently has been doing special work for the American Mining Congress.

Charles A. Cary, manager of the nylon division of the rayon department of the Du Pont Company, has been appointed assistant general manager of the rayon department, the principal products of which are nylon, rayon, and cellophane. Mr. Cary, who is 55, has held a variety of posts since he began his career with the Du Pont Company in 1918 as a trainee at the Wayne, N.J., black powder plant. He was assistant superintendent successively of the former Brandywine Works in Wilmington, the Wayne Works, and the Nemours, W. Va., Works and in 1923 was made superintendent of the Connable Works at Birmingham, Ala. His association with the Du Pont rayon enterprise began in 1925, and he was successively assistant chief and chief supervisor of a plant at Old Hickory, Tenn. Between 1928 and 1940, he was control manager and manager of the planning section for successive periods, becoming assistant manager of the nylon division in January, 1940, and manager in September, 1944.

A native of Machias, Maine, Mr. Cary was graduated with honors from Bowdoin College in 1910 and received the bachelor's degree in Civil Engineering from Technology in 1912. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown 72, Mass.

1914

The news item of the month has to do with Alden Waitt. It really is in two parts, the first of which has to do with the award of additional honors on November 5, when Alden received the Distinguished Service Medal and the Legion of Merit. The former was awarded to "Brigadier General Waitt, Assistant Chief of Chemical Warfare Service for Field Operations from May, 1943, to September, 1945, who performed exceptionally meritorious service in a duty of great responsibility." The citation continues with a summary of his activities in the African, European, and Pacific theaters of war. The Legion of Merit citation begins with his work as the first chemical officer of the Armored Force, in which he "displayed great initiative, organizing and training ability, and talents of the highest order in developing the Chemical Warfare Section of the Armored Force Board, School and Replacement Training Center and in preparing the units of the new army to meet gas offensively and defensively." The citation continues with a further recital of Alden's activities with special reference to his work in connection with the Air Forces. It ends with this statement: "He contributed in large measure to the advancement of national defense."

As if this were not enough for a single month, nine days later President Truman nominated Alden to be a major general with assignment as chief of the Chemical Warfare Service to succeed Major General Porter, who has lately retired. As these notes are being written, on Thanksgiving Day, Alden's nomination is awaiting a meeting of the Military Affairs Committee of the Senate to whom all such nominations are referred. Long before these notes reach you, the Senate should have confirmed the appointment. Your Secretary had the pleasure of seeing Alden the day before Thanksgiving. He had flown up to Boston the previous afternoon, and your Secretary accompanied him to Bedford Field for the return trip. The Senate's confirmation of Alden's promotion will make him the ranking active officer in the Class, a position held, until his recent retirement, by Rear Admiral Richey.

Your Secretary recently had occasion to make a short visit to Pittsburgh, where he tried to locate Levi Duff, but had the misfortune of missing him by a small margin. Duff in a subsequent note wrote that his oldest son, a captain in the Army, was on his way home from Germany, and that his youngest son, who was graduated from the Institute last June, was completing his midshipman's training and was about to be commissioned as an ensign early in November.

On the evening of October 29, Dr. Compton told the Alumni Council of his recent visit to Japan. It was one of the most fascinating talks your Secretary has ever listened to. Present from our Class to greet Dr. Compton were Horton, Hamilton, Hadley, Corney and his son, who is also an Institute graduate, Atwood, Crocker, Harold Wilkins, and your Secretary.

The subject of Dale Carnegie's column for October 12 was Don Douglas. The article dealt entirely with Don's student life at the Institute, with special emphasis on how Don used to budget his time so as to be able to take on extracurricular activities. The Carnegie article gives Don credit for putting the financially somewhat unsound Delta Psi fraternity of 6 Louisburg Square fame on a sound business basis. Perhaps that was the training which enabled Don to lead Douglas Aircraft from a one-man start to the position of largest unit in the field. — H. B. RICHMOND, *Secretary*, General Radio Company, 275 Massachusetts Avenue, Cambridge 39, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York 19, N.Y.

1915

To all my classmates, friendly holiday greetings! Our Alumni Fund totals continue to hit new highs. 157 of you (90 per cent) have given $3,294 (112 per cent). Nice going, and it will be better before the year closes.

George Rooney has gone in business for himself doing industrial building construction as George T. Rooney Company, 14 Pelham Street, Cambridge 39, Mass. Telephone: ELIot 1550. I know everybody will join in wishing the Pirate the best of success. He certainly deserves it. — Jim MacIntyre is now a brigadier general in the Ordnance Division of the regular Army in Washington. — Another class son married. Francis B. Herlihy (son of our Frank Herlihy), a captain in the Army, was married to Kathleen Ann Donovan on November 17 at St. Thomas Aquinas Church, Jamaica Plain. Young Frank was graduated from the Institute in 1942 and for several years saw action overseas in a tank outfit. — We are sorry to hear that Thayer MacBride has been ill. He has had two major operations and is still on the shelf at his home in South Weymouth, Mass. Our sympathetic wishes to Thayer for a speedy and complete recovery. — Dick Bailey keeps wandering around the country, and from New Haven he wrote: "Here, somewhat late, is my check to keep the Institute going for another year. Tech will now feel considerably bucked up. I, also, shall feel a little better. No need to thank me, as I am hard to catch, roaming as I do over considerable countryside."

The Boston class dinner on November 2 at Walker Memorial was the usual huge success with 28 classmates and three guests attending — an excellent record. Our outstanding guests were Eugene Eisenberg '43, XVII, a junior grade lieutenant and son of our Sam Eisenberg, and David Hamburg, son of Abe Hamburg. Eugene had just returned from a long tour of Navy duty in the Pacific. David is a private in the Army and was studying Japanese at Chicago University but I understand has since left for Japan to practice what he's learned. Then we had James W. Tonra, chief of the Brookline police department, and Louis A. Gale of the Gillette Safety Razor Company, recently adopted by the Class. The others were as follows: Henry Sheils, Jac Sindler, George Rooney, Max Woythaler, Robert Warren, Marshall Dalton, Speed Swift, Bert Adams, George Moulton, John Homan, F. E. Waters, John Wostrel, P. J. Munn, Louis Young, Weare Howlett, Bill Brackett, F. E. Murphy, H. L. Colby, Johnnie O'Brien, Charlie Norton (and sheep), Ed Sullivan, Wallie Pike, Frank Herlihy, Wayne Bradley, Clyde Mackenzie, Sam Eisenberg, Arch Morrison, Abe Hamburg, and Azel Mack.

Although Bert Adams has always generously and graciously done a show for our Class, this time he outdid himself in one of the most entertaining, mystifying, and amusing demonstrations. Bert gave a supershow, which provoked much conjecturing and questioning afterward and was thoroughly enjoyed and appreciated. Tribute should be paid to the loyalty of the long-distance men: Wayne Bradley came from Bridgeport, Conn.; John Homan, from Beverly; Max Woythaler, from Framingham; Honorable Speed Swift from New London, N.H., and for the first time recently Charlie Norton (with and without sheep) came from Martha's Vineyard, Mass. Coming to life after all these years and attending the class dinner for the first time was Clyde MacKenzie, as personable as during the old Boylston Street days, and the center of much friendly visiting with classmates.

After dinner, the business of the evening was planning next summer's reunion to make up for the postponed 30th. We agreed to hold it and reviewed the appointment of committees made last year. Despite the Herculean efforts of Marshall Dalton to maintain dignified order and George Rooney's and Weare Howlett's efforts to install parliamentary proceedings, the meeting went off with 1915's typically riotous informality. However, we shouldn't expect any more serious demeanor from such a gay bunch of good friends, and the whole discussion ended by leaving plans and arrangements in the hands of the committeemen, Max Woythaler and Weare Howlett, who did such an admirable job in making it possible for us to be at Oyster Harbors in 1940. We are having a New York dinner on November 30, when Max and Weare should have ready, a preliminary report after which you will get a first announcement of the reunion plans.

More class sons heading for Technology — read Ben Lassen's letter about his boy: "Yesterday I was in Boston, and among other things went to see Professor Chalmers, the Director of Admissions, in connection with my son's desire to enter M.I.T. for Course VI. The corridors were crowded with students, all seeking interviews with the same man. I could not wait my turn and tried to take a short cut by going to see Professor Moreland, whom I have known for a long time. Miss Martin, the professor's secretary, told me that he had been out of the country for a while and suggested that I mail the application to her for Professor Chalmers' attention. As I walked about the corridors of the Institute, I thought of you and telephoned you. . . . I am looking forward to meeting you on Dr. Compton's 15th anniversary at Technology."

Last month's notes stirred up good San Willis, who wrote this letter from St. Louis: "My hat is off to you for the fine job you have done with the class notes. As you say, the notes can be only what the members make them through their letters to you, but by the same token you, with

your example, inspire the letters, so the credit is still all yours. . . . By all means get the 1946 reunion ball rolling and depend on me to push it along in every way possible, including a promise of my presence. I shall be looking forward to the mail campaign and only wish I could promise to be at one or another of the preliminary dinners. . . . I managed to steer myself through Boston early in August and called your office, but alas! you were out of town at that time and again on the Sunday before Labor Day, when I reached town on my return trip. From this time on, I am afraid I shall be stuck in St. Louis, at least until late spring or early summer. Should you or any of the gang get this far West, please, oh please, look me up. . . .

"My work at Mississippi Glass continues to expand, now that material is available for other than war work, and I am up to my eyes in various and sundry developments, including several process patents which I sold to the company. As for living conditions here, you will note that we are still quartered at the hotel — enough said. I understand that in one instance recently a good (?) Samaritan left a fellow to drown in the river in order to have first chance at his apartment, only to find it was already rented to the man who had pushed him in. . . . On the personal and family side all goes well, although it is next to impossible to keep the better half out here when all four of the grandsons are in the East. We have about given up hopes of a granddaughter. My own health continues good, although I did celebrate Armistice Day by getting a sliver of beef bone stuck in my lower throat. The doctor had to get it out with a bronchoscope, and believe me that was some experience. There were no ill effects, however, and I am now completely recovered. . . . My daughter Peggy, who used to be at the Institute, is now Mrs. Ralph J. Waite, Jr., living in Boston. Her husband is a pilot of a T-C 47 and has just returned from overseas." . . .

Next month we'll give you a detailed report on our New York dinner and possibly the first plans for the reunion. Meantime, remember, a letter about yourself will "help Azel." — Azel W. Mack, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

1916

Isidore Richmond, Lieutenant Commander, U.S.N.R., has returned to the practice of architecture and engineering in Boston, his former stamping ground. His address is 16 Arlington Street.

David Longfellow Patten, a commander, who recently returned from his job on the staff of General MacArthur, broke into newsprint on October 29 with the announcement of his marriage at South Dartmouth, Mass., to Mrs. Dorothy Kendall Russell of Washington and Los Angeles. Let us hope Dave can get away for our 30th reunion next June at the Oyster Harbors Club on Cape Cod.

Some correspondence is going on between class officers at the present time because of the fact that our perennial reunion committee chairman, Steve Brophy, writes that he will be unable to head the plans for our reunion next June. As Secretary of your Class, I shall welcome suggestions for a new chairman and also any suggestions regarding the plans which have been tentatively made for the Oyster Harbors Club for approximately June 7 and 8. — James A. Burbank, *Secretary*, The Travelers Insurance Company, Hartford, Conn. Steven R. Berke, *Associate Secretary*, Berke-Moore Company, Inc., 11 Boylston Street, Brookline 46, Mass.

1917

Thanks are due to Ted Bernard, who wrote the notes last month, for some of the material appearing below, which was received too late for inclusion in last month's column.

Dick Whitney has recently left the service as a commander in the Naval Reserve and has established his own business in Norfolk, Va., as a manufacturers' agent for farm, home, and automotive equipment. The secretaries would welcome a more detailed report from Dick himself in amplification or correction of the above, which was received by rather devious non-Technology means.

Through Rudy Beaver we learn that W. W. Rausch is president of Anchorage Homes, Inc., which will presently have in operation at Westfield, Mass., the largest factory in the world devoted to the manufacture of traditionally designed prefabricated houses. The factory is designed to turn out its product on an assembly-line basis comparable to that used in the automobile industry. In building the "Anchorage," a naval community at Newport, R.I., during the war, the company was able to test its methods and to perfect its financing plans for the individual buyer.

Writing to Ray Stevens from Kunming, China, in October, Al Hegenberger, now a major general, says: "I am now commanding the Tenth Air Force, and in a few days will move the headquarters to Shanghai. I haven't had the good fortune of seeing Bill Sullivan in years but have read a good deal of his activities during this war. My chief of staff was a guest of Bill in Manila recently and was tremendously impressed by the magnitude of the job he was performing. If the opportunity presents itself after I get to Shanghai, I intend to hop over to Manila and call on Bill."

Irving B. Crosby writes to say: "I am oscillating between Nova Scotia, Ohio, and Virginia — sampling the bogs and fogs of New Brunswick and Nova Scotia and the oysters and sun of Virginia — and prefer the latter. I expect to be farther south this winter, but that will be another story."

Ed Woodward, writing to Ted in October, says: "Upon my return today from Wolfeboro I found your card and its plaintive note, which leads me to check in with news just of myself. News really is not the right word for I never do exciting things like writing books or making speeches or getting elected; but just plod along in a quiet way worshipping God, working at my business, tending the family's wants, gardening, chopping wood, and painting pictures for recreation. In short, I'm just trying to prove that it is we unambitious ones who have all the fun."

Ken Bell reports that Barney Dodge has left the confines of Oak Ridge, Tenn., where he participated in the atomic bomb development. He will not return to his professional duties at Yale until next spring since he is currently engaged in some special work at Wilmington, Del. Ken also reports that Dave Pierce is working in New York as a chemical engineer with General Aniline.

A. C. Carlton has received the War Department award for meritorious civilian service at the Chicago Ordnance District, where he is serving as administrative assistant to the chief of the inspection branch. Carlton was cited by General Brehon Somervell, for "the development of many programs, which in addition to improving the effectiveness of inspection, have gained national importance." Before the war, Cliff was a curator of the Museum of Science and Industry in Chicago. He lives at 1368 East 57th Street, Chicago. — Clair Turner is visiting professor of health education at the University of California School of Public Health, Berkeley 4, Calif.

Ras Senter, Dallas Petroleum Company of Dallas, Texas, reports: "Very little news from this end of the line. The war seemingly stopped all 1917 men from traveling this far south. With the end of hostilities, however, and business beginning to resume normal activity, I am looking for and hoping to see some of our old friends again. I am still producing oil, though somewhat restricted by war conditions."

Gus Farnsworth, Gus, Jr., and Mrs. Farnsworth called briefly on the Assistant Secretary at Meriden, N.H., in early November, and he is glad to be able to report that Gus is completely recovered from the injuries described in the November notes. Gus, Jr., was released from the Army Air Forces in November and by this time will have begun his college work at Dartmouth. Gus's daughter is a senior at Smith College.

Lin Noyes finished his second term as president of the American Newspaper Publishers Association in April, 1945, but remains on the board of directors. He is also a member of the Newspaper Industry Advisory Committee to the War Production Board, now Civilian Production Administration, a connection which brings Lin to Washington and New York every month. — Raymond Stevens, *Secretary*, 30 Memorial Drive, Cambridge 42, Mass. Philip E. Hulburd, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

1919

The club notes section of the November Review carried the following news items about members of our Class: A. R. Wiren has been elected a governor (serving to 1947) of the Technology Club of New York. Jacob Braverman has just become a new member of this club. M. P. Smith attended a recent meeting of the Washington Society of the M.I.T. — Ed Deacon with Climax Engineering Company in Clinton, Iowa, writes that he has been busy reconverting the Clinton, Chicago, and Tulsa plants — the Climax Engineering Company at Clinton, McAlear Manufacturing Company and General International at Chicago, and Hanlon-Waters at Tulsa — to peacetime production. His plants are about to produce a new rotary plow which should revolutionize tilling and seed bed preparation in this country. They are also about to produce for the first time shallow well and jet type pumps.

Myles F. Connors is still carrying on his business from home, not having completely recovered from his long illness. He writes, "I am doing this with the aid of dicta-

phone, telephone, calculating machine, good office help, and a sense of humor." — Laurence A. Gillett, Room 1522, 101 Park Avenue, New York City, residing at Apartment 613B, Larchmont Acres, Larchmont, N.Y., has been officially appointed division engineer in charge of the New York region of the Federal Works Agency covering eight states in New England, New York, and New Jersey. — The Gardner, Mass., *News*, of November 17, carried a story about Lieutenant Bent, United States Army, son of Mr. and Mrs. Roderic L. Bent. Rod's son Gardner is stationed in the Philippines 85 miles south of Manila. His son enlisted in the Reserve Corps in 1942 while a student at Technology and reported for active duty in June, 1943. — EUGENE R. SMOLEY, *Secretary*, The Lummus Company, 420 Lexington Avenue, New York, N.Y. ALAN G. RICHARDS, *Assistant Secretary*, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

1920

It has been a great shock to all of us to learn of the untimely death of our beloved classmate, Hobart Oakes Davidson, on September 22. H. O. was with the American Viscose Corporation in Wilmington, Del. I have been unable to secure further information at this writing. I am sure all of us will feel this loss keenly, as he certainly was one of the most popular men in the Class.

At this writing, shortly after the appearance of my November letter, I should like to make public acknowledgment of response by way of letters and contributions to the class gift from Bob Bradley of Precision Products Company in Waltham and from Joe Margolis of Lenox, Inc., in Boston. If I weren't a superoptimist, I should not have remained class secretary for these many years; so I am still hoping that by the time these notes see the light I shall have received a considerable number of additional letters and contributions.

Bob Van Volkenburgh, a brigadier general, has left Camp Stewart, and is commandant of the Army Antiaircraft School at Fort Bliss, Texas. Downs McCloskey is in Pasadena, Calif.; address, 736 Burleigh Drive. Andy Johnson is in Woodstock, Conn. Phil Haebler has left Montclair, N.J. and is living at the Larchmont Shore Club, Larchmont, N.Y. Aaron Bradshaw, a brigadier general back from overseas, is in Washington; address, 2314 20th Street, North West.

Just because we have gone into our 26th year, don't think that Victory Bonds for the class gift are no longer acceptable. We intend to keep the lists open until our reunion, which we hope to hold before many months. Do let me hear from you. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

1921

The year of 1946 brings high hopes for peace and more normal living. Whatever the outcome, it is certain to go down in history for a 25th reunion that tops all the many successful parties we have enjoyed in past years. Make your plans now to include it in this summer's program. And while you have it in mind, call up the fellows in the vicinity and sell them on the idea of going along.

A. Warren Norton, XV, President of the Alumni Association, continues in the news. He was one of the speakers at the celebration on December 5 arranged by the Technology Club of New York to honor Dr. Compton's 15th anniversary as president of the Institute. In the marts of trade, Warrie has announced that Press Wireless, Inc., of which he is president, has organized a manufacturing subsidiary, Press Wireless Manufacturing Corporation, which he will also head.

Ernest R. Gordon, XII, has announced his entrance into consulting engineering practice in the field of mining and related projects. Ernie has most recently been with the American Smelting and Refining Company in Mexico. His temporary address is care of J. Vandemoer, Sunrise Acres, El Paso, Texas, pending the opening of his new office in Montana.

George V. Davila, I, a lieutenant commander, has a 20-year-old daughter, Elena, who is making an outstanding record as a student at the Columbia University school of architecture. Elena won the Hamlin prize, awarded for the best design in social architecture, with a playground shelter design. She is specializing in town planning, housing, and civic buildings. George was formerly with the Puerto Rico Government department of public health at San Juan before his assignment to sea duty with the Navy.

Emmett J. Scott, I, is with the New York City board of water supply, engaged in the project to supplement the Croton and Catskill supply with water from the Delaware River watershed. Except for his first job with the Boston Elevated, he has been with various New York municipal departments ever since graduation. The first of these was the transit commission, with which he was employed in checking fabrication plans for the city-owned subway lines. Following completion of the subway, he went to the department of plants and structures, where he was assigned to bridge design. Here he had a part in the construction of the Triborough Bridge, calculating cable stresses, laying out the main tower trusses, and being responsible for inspecting all foundations. Later he was in charge of tower design for the Whitestone Bridge.

Now what's your news? — RAYMOND A. ST.LAURENT, *Secretary*, Rogers Corporation, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, International Standard Electric Corporation, 67 Broad Street, New York 4, N.Y.

1922

News from our classmates, who have been in the services, is coming in steadily. All the news is interesting, but we can hit only the highlights in this column.

William W. K. Freeman, a lieutenant in the Naval Reserve, is back home at 31 Warren Street, Salem, Mass., after several trips across the Pacific in the *Kittson Maru* dodging typhoons, Japs, and air attacks, the latter incurred in landing amphibious forces on Okinawa. — C. Ford Blanchard, a commander, is back in civilian life after five years in the Navy, for some of the time as an instructor at midshipman school, and for the last two years as resident inspector of naval material at Wheeling, W.Va. Blanchard is looking for a new connection, since his old company has gone out of business. His New York address is in care of W. C. Langley and Company, Room 500, 115 Broadway, New York 6, N.Y. — Charles E. Brokaw, who enlisted in April, 1942, and became a full colonel in April, 1945, has been awarded the Air Medal and the Bronze Star for his part in the campaign on Mindanao in the Philippines. He is assistant chief of staff in the Supply Division and responsible for supply, evacuation, and logistical support of the Mindanao forces. He also took part in the landing at Salerno, Italy.

Assistant Secretary Whitworth Ferguson, President and founder of the Ferguson Electric Construction Company in Buffalo, has his business so well organized that it runs itself. No sooner did Whit return from a four-month secret mission to Germany than he was named chairman of the postwar planning section of the Buffalo Chamber of Commerce. Whit was a member of the 17-man United States Strategic Bombing Survey group, which assessed results of American bombings in German cities. — Believe it or not, Cupid is still active in our venerable Class. Newspapers have recently carried mention of the engagement of William H. Noyes, an ensign in the Naval Reserve, to Eleanor E. Lowell of Amesbury, Mass., and on October 16, Abraham J. Silverman, an Army colonel, was married to Clara Lavenstein of Washington, D.C. — Frank Gage of musical fame has gone back into the electrical business, having made a connection with the Solar Manufacturing Corporation at 285 Madison Avenue, New York City. Solar are manufacturers of condensors, and Frank expects to take over the sales activity in the Chicago area.

Earnshaw Cook has the right idea and apparently he knows how to put it into effect. He has signified his intention to retire from the active practice of metallurgy and is resigning as chief metallurgist of the American Brake Shoe and Foundry Company at the end of this year. He will continue in a consulting capacity but intends to make his permanent residence on his farm on Kent Island, Md. He admits that he may do a modest consulting business and perhaps write a few articles on metallurgical subjects, but intends to devote most of his energy to loafing, fishing, and duck shooting. Thinking of Cook on Kent Island just loafing, fishing, and hunting has robbed your Secretary of all ambition to scramble any more notes for this issue and, with apologies for missing the last issue, closes with the admonition to remember the 1922 Scholarship Fund. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. WHITWORTH FERGUSON, *Assistant Secretary*, 333 Ellicott Street, Buffalo 3, N.Y.

1923

J. Elsworth Rogers reports that he retired from the Royal Canadian Air Force last spring and has since been devoting himself to certain broadcasting interests in Toronto. He sold out his radio manufacturing business in February, 1941, to join the R.C.A.F., in which he spent four years helping to train air crews.

J. A. Pennypacker is chief estimator for the Quincy yard of the Bethlehem Steel Company. He lives in Quincy with his

family. He has a twin sister. His mother is 86 years old and important enough for the Boston *Herald* last July to print a half column about her on her arrival in Boston from Philadelphia. She and Jim were also photographed for the paper. It seems that Mrs. Pennypacker is a puzzle expert. She makes them up for national puzzle magazines. She belongs to the Diamond Club of Philadelphia, said to be the oldest puzzle club in the world, also to the American Cryptogram Association and the Yankee Puzzlers of Boston. A monthly meeting of the latter brought her to Boston.

It has been a long time since a report was made in these notes of the participation of 1923 men in Alumni affairs. The extent of this participation is shown in the 1945–1946 Directory of the Alumni Association, issued in October. Richard L. Bowditch is a term member of the Institute Corporation. The following are serving on committees of the Alumni Association: audit and budget, Hugh S. Ferguson; Friends of the M.I.T. Library, John E. Burchard; honorary members, James A. Pennypacker; national nominating committee for District 10, Charles H. Toll, Jr.; nominating committee for departmental visiting committees, Bernard E. Proctor and George A. Johnson. Robert E. Hendrie is a member of the advisory council on athletics. George A. Johnson is class representative on the Council. And the following represent local associations and clubs: Chile, John E. Burchard; Duluth, Bernard E. Proctor; Miami, Horatio L. Bond; Newark, James A. Pennypacker; Philadelphia, Edward J. Healy; San Francisco, Hugh S. Ferguson; alternates, Egon E. Kattwinkel and Herman F. Pike. On departmental visiting committees are the following: Architecture, Louis H. Skidmore; English and History, Malcolm Johnson; Division of Industrial Coöperation, Uncas A. Whitaker.

Robert P. Shaw is president of the Class and class agent for the Alumni Fund. The following are officers of local associations or clubs: Buenos Aires, Luis A. Igartus, President; Miami, Clarence P. Thayer, Secretary-treasurer; Monterrey, Bernardo Elosua, Secretary; Montevideo, Francisco Ravecca, President; Oslo, Harold J. Bjerke, President; Port Arthur, Henry Flynn, President; Toronto, John S. Keenan, President. Certain Alumni have been appointed as honorary secretaries of the Institute by President Compton; they act as academic ambassadors and local representatives of the Alumni Association. These men, who interview prospective students and help in placement of men and in other ways, are: Los Angeles, Kenneth C. Kingsley and Charles H. Toll, Jr.; Denver, Alfred E. Perlman; New Haven, Albert S. Redway; Fort Wayne, Frank J. Travers; Omaha, Louis A. Metz; Paterson, Edmund J. Thimme; Westfield, Lyman L. Tremaine; New York, George W. Gilman, John J. Murphy, and Robert P. Shaw; Akron, John D. Cochrane; Toledo, Herbert A. Barnby; Lancaster, Charles K. Miller; Knoxville, Van Court M. Hare; Charleston, W. Va., William S. Brackett; Buenos Aires, Jose Carlos Bertino; Toronto, John S. Keenan; Oslo, Harold R. Bjerke. — Horatio L. Bond, *Secretary*, 457 Washington Street, Braintree 84, Mass. Howard F. Russell, *Assistant Secretary*, Improved Risk Mutuals, 60 John Street, New York 7, N.Y.

1926

Perhaps one of the most interesting assignments that any one of our Class has had during the war came to light in the following letter from Whitney Ashbridge, a lieutenant colonel in the Army: "Now that the wraps are off the atomic bomb, I can tell you that for the year and a half when my address was merely a post-office box in Santa Fe, N.M., I was in command of the then very, very secret post at which the main laboratory was located. It was a most interesting assignment, and the bomb fulfilled our expectations in saving lives by shortening the war. I'm now en route to Japan [October 12, 1945] but should be out fairly soon, as I have enough points for discharge. I had an interesting few months on Luzon."

Ken Billings is back from Europe and in civilian clothes. In fact, since returning, he has spent most of his time at Martha's Vineyard, plucking and shucking scallops and doing other delightful things of a quite unmilitary nature. — A letter from Bill Meehan indicates that he has returned to Boston, where he continues with the Great Atlantic and Pacific Tea Company.

An Army release recently received reports that Isaac W. Gleason was awarded the Legion of Merit for performance of outstanding services as wire officer in charge of telephone and telegraph communications in the Mediterranean theater of operations. Said the citation: "In preparing the wire communications movement plan used in the transfer of Allied Force Headquarters from Algiers to Caserta, Lieutenant Colonel Gleason was personally responsible in large part for the success of the operation in moving the world's largest purely military wire communication center between two points widely separated by water. Subsequently to the transfer of Allied Force Headquarters, he personally surveyed the remaining wire communications system in North Africa and prepared therefrom in full detail a comprehensive plan for the operations, maintenance, and eventual orderly disposal of Allied Force Headquarters communications interests in that territory."

Colonel Gleason was overseas about two years. He wears the Mediterranean Theater Ribbon with one battle participation star, and the Italian Government decoration of Crown of Italy, Knight Officer's degree. Before entering the Army, he was with the industrial department of the New Jersey Power and Light Company.

While visiting the Dewey and Almy Chemical Company in Cambridge one morning in November, George Smith met Fred Walch, who is in charge of continental affairs for Dewey and Almy. Fred has been shuttling across the Atlantic since the start of the war and is preparing to return to France this spring. Early in 1945 he spent several months in Belgium, France, and Holland, and on his return he stopped in London, where he saw Dave Shepard, who has been made chairman of the board of the Anglo-American Oil Company. Those of you who attended the last Alumni Banquet will recall our pleasure at having Dave's father drop over to the '26 table.

Laurence G. Cumming, a commander in the Navy, visits the Institute frequently in the line of duty. He is attached to the Office of Research and Inventions of the Navy Department and is sitting on a board charged with the disposition of property in the Radiation Laboratory at the Institute. — Natale Gada has moved from New Haven to Syracuse, where he continues with the General Electric Company. — James R. Killian, Jr., *General Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

1927

The Boston *Globe* of November 2 carried the following article: "Edward J. McCabe, 420 Huron Ave., is an engineer employed by the State Department of Public Works. He is a graduate of Cambridge High and Latin School and of Tufts Engineering School, and studied at . . . Technology. He is a member of the Massachusetts State Engineers Association, and Local 780, Federation of Municipal, State and County Employees, A. F. of L."

The Institute also received word from H. B. Cuthbertson, a lieutenant colonel with the Signal Corps in the European theater, as follows: "Since you are trying to get a record of decorations and war service, you may as well add to the rest a French Croix de Guerre with Gold Star that I was recently awarded, together with a kiss on both cheeks by a very nice little major general with a long mustache that tickled me physically as well as mentally."

In answer to a letter we wrote to J. F. Donovan, Jr., a Navy captain, we received the following: "I was in command of the Pacific Fleet Schools from May, 1945, until August, 1945, when I was put in charge of the Training Command at Pearl Harbor. Since the first of September, I have been acting commander of the Training Command, Pacific Fleet. Before these employments, I was commanding officer of the U.S.S. *San Juan*, an antiaircraft cruiser, from the invasion of the Marianas to the capture of Okinawa."

The following letter was received by us from R. Folsom Hayward, formerly of the armed forces: "I volunteered in April, 1942, and was sent to Officers' Training School in Miami Beach. I subsequently became sub-depot commander at Army airfields in Herington, Kansas, and Lubbock, Texas; then executive officer of the Aircraft Maintenance Branch, Headquarters, Second Air Force, Colorado Springs, Colo. I finally wound up in the Marianas as combat maintenance officer, Headquarters, XX Bomber Command, 20th Air Force flying all B-29s. I got home last May on emergency leave when my home in Bratenahl, Ohio, burned to the ground. I was separated from the service at Camp Atterbury, Ind., and reverted to inactive status as major on August 25. I moved to San Francisco because it seemed the most delightful city I've seen. I am vice-president of the Veterans Union of America — a national organization exclusively for men and women of World War II. Mine is certainly not a very exciting military record: the Asiatic Pacific Theater Ribbon with four bronze campaign stars — not even a good conduct medal."

Volney Finch, formerly a commander in the Navy, writes as follows: "I have just returned to Stanford, where I have been employed as professor of mechanical engineering and consulting air transport engineer since 1933, with the exception of time on active duty as a naval aviator from

1941 to 1945. While in the Navy, I was officer in charge of airplane design and development in the Bureau of Aeronautics, Washington, D.C., and then maintenance services officer on the staff of the commander of the Air Force, Pacific Fleet. Until Jap surrender, I was responsible for maintenance, repair, and overhaul of all naval aircraft and aircraft engines in the Pacific Ocean areas."

Eddie Cahill is with the Skelly Oil Company and has recently moved to Guymon, Okla. He writes as follows: "Your letter came in the nature of a surprise as I don't hear very often in these days from 'back East.' There apparently aren't many M.I.T. men in the Oklahoma Panhandle. In fact, there aren't many men at all out here. The country seems to be populated almost exclusively by jack rabbits and rattlesnakes! About a month ago I was transferred out here from Evansville, Ind., to watch a deep wildcat test we are drilling in southeastern Colorado and incidentally to pit the casing points on gas wells in the vicinity of Guymon, Okla. The fact that the two areas are more than 200 miles apart, round trip, seems to be immaterial. In this country they drive that far to go to the corner drugstore. We've already had two snowstorms, as the Colorado elevation is more than 4,000 feet, and one of these days it will probably start and forget to stop until late spring, so if my Tech Reviews remain uncalled for at the local post office, you'll know what happened to me. However, anyone who braved those icy Boston winds on the Charles River bridge for four years shouldn't let a minor disturbance like a Colorado blizzard bother him." — Joseph S. Harris, *General Secretary*, Shell Oil Company, Inc., 50 West 50th Street, New York, N.Y. Dwight C. Arnold, *Assistant Secretary*, Stevens-Arnold Company, Inc., 22 Elkins Street, South Boston 27, Mass.

1928

Gil Ackerman is now operating manager of the American Mail Line, 740 Stuart Building, Seattle, Wash. Gil says: "At the present time, and for some months after the war ends, we shall be operating a fleet of some 60 or more vessels, after which the service will probably reduce to some 12 or 15 vessels engaged in the run from Puget Sound and the Columbia River to the Orient."

John Leslie has been elected vice-president of the Pan American Airways for its trans-Atlantic operations. Leslie is a pioneer in overseas flying, a veteran of nearly 17 years with P.A.A., and had been the manager of the company's Atlantic division since January, 1941. The new Vice-president joined P.A.A. in 1929, only two years after it established scheduled operations on the 90-mile route between Key West, Fla., and Havana as the nation's first overseas airline. For the first nine years of his career he served in various engineering posts in the company's operations throughout Latin America. In 1938, Leslie branched out as division engineer and operations manager at Alameda, Texas, and two years later he moved to San Francisco to help organize P.A.A.'s operations to Australia and the Orient as operations manager of the Pacific division. He came to La Guardia Field, N.Y., on January 15, 1941, as division manager of the Atlantic division. As Atlantic division manager, Leslie was technical advisor in charge of the historic flight of the late President Roosevelt to Africa for the Casablanca Conference. During the past year he served as chairman of the airlines committee which worked out arrangements for design, space, and leasing at New York's new $200,000,000 airport at Idlewild, Queens. He also served as a company representative at the International Air Transport Association meetings at Havana last April and at the session just closed at Montreal.

Hall Hibbard, Vice-president and chief engineer of Lockheed Aircraft, supervised development of the new jet fighter — the P-80 *Shooting Star*, whose whistle (literally that's its sound) is commonplace over Burbank, Calif. In a recent interview with press representatives, Hibbard said: " 'Every conventional type of fighter plane is now obsolete.' He includes his own P-38 when he says that. Other Hibbard statements, made in an interview: Propellerless jet planes will replace reciprocating motor type craft within 10 years. Jet planes, using kerosene as fuel and drawing air from the atmosphere, can take us probably 100 miles above the earth. Transport speeds of 1500 miles per hour will be common. Where jets stop, rockets will carry on, once the problem of fuel and oxygen storage is solved. (A rocket carries its own air supply.) 'Once we get out of the earth's air, there's no gravity or friction to hold a plane back,' Hibbard explains. 'Theoretically, there is no reason why 100,000 miles an hour can't be attained. Such rockets could fly to the moon.' Can man stand such speed? Yes, he says, if it is reached gradually. Pilots, it has been demonstrated, can take superspeeds if the rate of acceleration is controlled. And what about the family flivver of the future? 'The jet-driven family helicopter of 10 years from now will be the safest, simplest, pleasantest, most convenient form of travel ever devised,' Hibbard predicts. The helicopter blades would be driven by jets streaming through the rotor tips so that they resemble a lawn sprinkler spinning upside down."

Joseph K. Roberts has recently been promoted to the position of general manager of research by the Standard Oil Company of Indiana. Frank W. Horn and Emily Morton Williams were married this past fall at New London, N.H.

Here is a note from Ralph Jope: "Today Robert J. Proctor, Course X, now a lieutenant commander in the Navy, dropped in to see me. He is now on terminal leave after having been a wearer of the Navy blue since July, 1942. From the time he went in the service until April, 1944, Bob was located in and around the Philadelphia area; then he was assigned to the Pacific and recently served as gunnery officer on the U.S.S. *Santee*, one of the escort carriers. Bob participated in the invasion of Guam, Morotai, the Philippines, and Okinawa. In the Battle of Leyte, his carrier, the U.S.S. *Santee*, was first damaged by a kamikaze and then by a torpedo. Bob's ship also participated in the occupation of Japan and the rescue of prisoners from Formosa."

Clifford Terry of 85 Hillside Avenue, Glen Ridge, has been appointed material control manager for the radio equipment division of the Federal Telegraph and Radio Corporation. He has been with F.T.R. since 1941 and has served successively as assistant to the production manager and as a plant superintendent.

The following Navy press release has been received from Guam: Ellis A. Johnson, a commander in the Naval Reserve, whose wife, Alice, lives at 419 Essex Avenue, Chevy Chase, Md., has been awarded a Letter of Commendation by Vice-admiral J. H. Hoover, U.S.N., Commander, Marianas. The citation, his second, said: "For excellent service as mining officer and assistant gunnery officer on the Staff, Commander Aircraft, Central Pacific Force, from March 12 to May 4, 1944, and Commander, Forward Area, Central Pacific, from June 30 to July 28, 1944. The aerial mining of an enemy bomber by land-based aircraft owed its success to a considerable degree to his outstanding technical efficiency. The training, planning, and briefing for these missions were arranged by him in a thorough, accurate manner. His handling of ordnance and gunnery matters was marked by conscientious application and an unusually high degree of efficiency. His conduct throughout distinguished him among officers performing duties of the same character."

Finally, a word about our President, Ralph Jope. Ralph has recently brought to a very successful climax the 1946 fund-raising campaign in Winchester for the United War Community Fund campaign. Ralph was town chairman for Winchester, and with the help of his team of 700 volunteers, he raised $63,000 in Winchester, Mass., a town of only 3,700 families. — George I. Chatfield, *General Secretary*, 6 Alben Street, Winchester, Mass.

1931

The armed services have figured very prominently in the news of the Class over the past few months. Samuel S. Abramson, a major, is in Manila, after a long stay in New Guinea. He is with the Base Quartermaster Section, keeping the supply situation under control. — Through a news release from the Commandant's Office at the Puget Sound Navy Yard in Bremerton, Wash., we have been informed that Curtis B. Brown, a junior grade lieutenant, has reported for duty in the electronics office of the Puget Sound Navy Yard, where the mightiest warships of the Pacific Fleet are repaired and overhauled. Mrs. Brown and their two children, Mary Ellen, nine, and William, five, are living temporarily at Chapelle, Neb., which is Lieutenant Brown's home town. Before his transfer to Puget Sound, he was an instructor at the Naval Training School at M.I.T.

G. Hugh Vivian, a captain in the British Army with Force 136, Calcutta, India, wrote recently that he was stationed somewhere in India and that he was only three miles away from a mine where he had been located before visiting M.I.T. several years ago and had paid two visits to it recently. He says that the country is beautiful there and very hilly. His living quarters are grass or bamboo huts, and he is constantly on the move. At the time he wrote, he had received two mails in three months, and it was but the second time he had had an opportunity to send mail. Although he is pretty much isolated, his outfit has a small portable wireless set, which keeps him somewhat in touch with world affairs.

Some of the men in his company had never heard a wireless set before. As Captain Vivian has spent considerable time in India, he can speak the language, a great asset.

The Secretary of the Technology club in Miami, C. P. Thayer '23, has forwarded information about Carl Orleman. Carl has recently received a promotion, but what, the information does not specify. He is with the Technical Intelligence in Paris, and his full address is: First Lieutenant Carl Orleman, Supreme Headquarters, Allied Expeditionary Forces, A.P.O. 757, care of Postmaster, New York, N.Y.

Jack Wilkinson, who is a captain in the Army, has returned from service in Italy and is to be stationed out West. His home address is 438 Navarre Avenue, Coral Gables 34, Fla.

H. Sheldon Smith has been promoted to the grade of captain at the Chicago Ordnance District, where he is assistant chief of the termination section of the tank-automotive branch. Sheldon entered the Army as a private in May, 1942, and was graduated from the Ordnance Department's Officers' Training School at Aberdeen Proving Ground in January, 1943. — Arsene W. Morin, a major, has been assigned to serve as an executive officer of the Air Technical Service Command's Field Communications Station in Cambridge. The Cambridge installation is operated as part of the radio and radar subdivision, A.T.S.C., in conjunction with Technology. Before entering the service, Arsene was employed as an industrial engineer by the Evans Company in Boston and as chief of the construction crew by the J. E. Morin Company in Boston. From 1936 to 1942, he was with Western Electric Company at Kearney, N.J., as an industrial engineer. Since being in the Army, he has been stationed at A.T.S.C. installations at San Bernardino, Calif., and Patterson Field, Ohio.

We regret to report the death of Leland M. Burr, Jr., a lieutenant commander, who died from wounds in the South Pacific. — Edward H. Clouser, a lieutenant colonel, who has just returned to this country after 28 months' service in Burma and India, has been assigned to duty with the Office of the Quartermaster General in Washington as executive officer of the general administrative services division.

Ed Heffernan and Glenn Goodhand recently joined the ranks of the married members of the Class. Rosemary Thomson became the bride of Captain Edward M. Heffernan in a ceremony at Rutland, Vt. After a wedding trip to Banff and Lake Louise, Ed, who is on leave after three and one-half years in the Pacific, will report for reassignment. Josephine Halbieb Harrington became the bride of O. Glenn Goodhand, an Army major, in Rochester, N.Y. After a honeymoon at the Cloisters, Sea Island, Ga., Glenn and Mrs. Goodhand will make their home in Harwood Lane, Rochester, N.Y. Major Horace Ford, Jr., was Glenn's best man, and among those attending the wedding were Harold and Mrs. Genrich of Buffalo. Glenn returned from two years' overseas service only a few days before his wedding. He was a liaison pilot, engaged in air observation for the Field Artillery. He wears the Silver Star, the Bronze Star, the Air Medal with six Oak Leaf Clusters, and the European theater of operations ribbon with five battle stars. — Benjamin W. Steverman, *General Secretary*, 11 Orient Street, Winchester, Mass.

1932

This month we have only one press release and some address changes for you. Letters would certainly be appreciated.

Charles H. Peirce has been appointed sales manager of Edward Blake Company of Newton Center. They sell for many firms specializing in the manufacture of tool room machines and allied products. Charles M. Davis is at Robert College, School of Engineering, Istanbul, Turkey. Julius Grozen, a Navy lieutenant, is back from the Pacific and at Fall River, Mass. Royal B. Jackman has moved from Dallas, Texas, to Santa Monica, Calif. Arthur L. MacKusick, a lieutenant colonel, has changed his address from Aberdeen Proving Ground to Malden, Mass. Samuel G. Nordlinger, also a lieutenant colonel, has a Fairlington, Va., address instead of an A.P.O., New York City. — Clarence M. Chase, Jr., *General Secretary*, 1207 West 7th Street, Plainfield, N.J. *Assistant Secretaries:* Carroll L. Wilson, 1530 P Street, Northwest, Washington, D.C. William A. Kirkpatrick, Allied Paper Mills, Kalamazoo, Mich.

1933

We have finally gotten some mail, and with pleasure pass it along to you: From Samuel H. Hopper, VII: "During the war period, I was on active duty with the Public Health Service, detailed to the Navy and assigned to the sanitary engineering service of the War Shipping Administration. I carried on ship inspections with particular reference to the water supply, insect and vermin control, and general sanitation. At the present time I have joined Dr. T. B. Rice as associate professor to aid in the development of a new department of public health at the Indiana University medical school in Indianapolis. We hope to give medical students some appreciation of the general value of public health with particular reference to sanitation. Other duties will be included as a 'consultant' to the state board of health."

From Russell J. Brooke, XV: "For the past five years, I have been helping the Navy in recent unpleasantnesses but hope soon to be a civilian. My Navy history includes two years as assistant district material officer in charge of repair and conversion of Navy ships in the civilian shipyards of Jacksonville, Fla. Then two and a half years in destroyers of the Atlantic Fleet, as navigator, as commanding officer, and then as division commander. I am now commanding officer of a fleet cargo ship. My rank of commander is a recent acquisition." Thanks for the notes — it was good to hear from you both!

Last month when Max Gene Nohl, II, was lecturing at the Brooklyn Academy of Music, it was interesting to hear of his activities. He showed movies of the deep-sea diving he has been doing — especially now for ships which have been torpedoed off the United States Coast. He had some very interesting underwater shots, some in connection with his work and others just playing around on the bottom of a lake. He told us that he was married last spring, and that his wife is now learning to dive, too.

Here's wishing you a very happy, healthy, and prosperous 1946. — George Henning, Jr., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn 7, N.Y. Robert M. Kimball, *Assistant Secretary*, Room 3–208, M.I.T., Cambridge 39, Mass.

1934

We have quite a bit of chest-swelling news from some of our classmates who have been in the service. Edward B. Locke, a lieutenant colonel, has been released from General Courtney H. Hodges' victorious First Army headquarters staff to be separated from the service under the Army's point system. At the time of his release, Colonel Locke was head of the organization section of the First Army. As a member of the planning group under General Omar N. Bradley in London working out the details of the initial invasion of Europe through Normandy, Ed was responsible for issuing all orders moving First Army units. During the campaigns on the Continent, he issued all First Army orders to move troops during battle. Awarded the Croix de Guerre with gold star by the French Provisional Government for his participation in the liberation of France, Ed also wears ribbons from all three theaters of operation — the European, the Pacific, and the American. On his European Theater Ribbon he wears an arrowhead for his Normandy beachhead landing, and five battle stars for the campaigns of Normandy, Northern France, Ardennes, Rhineland, and Central Germany. In addition, he also wears the American Defense Ribbon. At the time of the Japanese surrender, Ed was in the Philippines at Luzon with General Hodges and other First Army headquarters staff members. Called up to active duty from the reserves as a first lieutenant at Fort Belvoir, Va., in December, 1940, he was promoted to the rank of Captain in February, 1942. His original commission in the Reserve was obtained upon his graduation from the Institute. Transferred to the First Army headquarters at Governor's Island in September, 1942, he went overseas in October, 1943, landing in Bristol. Ed holds his present commission in the General Staff Corps. Before entering active duty, Ed was metallurgist for the Carnegie-Illinois Steel Company at Youngstown, Ohio. He plans to re-enter the business as a production supervisor of manufacturing.

For distinguishing himself by "meritorious service in the performance of his duties," John Hancock Keatley, a commander, has been decorated with the Bronze Star. The medal was presented by Rear Admiral Robert O. Glover, Commander Service Force, U. S. Seventh Fleet, aboard Admiral Glover's flagship somewhere in the Philippines. Commander Keatley now serves as assistant force maintenance officer of the service force, Seventh Fleet, covering the entire southwest Pacific and the Philippine Islands. During the present war, John has continued his lifelong specialization in naval engineering. During the last two years, he has had wide experience in designing and equipping amphibious landing craft. He is a member of the Naval Architects and Marine Engineers Association, and an honorary member of the New York Yacht Club. Mrs. Keatley and daughter

Avery, four, live on First Division Road, Fort Benning. A daughter was born to the Keatleys in July on the day the commander received his Bronze Star.

Captain Louis T. Montant, Jr., who is a staff officer to the deputy executive commissioner of the Allied Commission, Mediterranean Theater of Operations, United States Army, recently was appointed an honorary member of the military division of the Most Excellent Order of the British Empire. The presentation was made by Field Marshal Sir Harold R. L. G. Alexander, Supreme Allied Commander, at a formal investment ceremony held in the grounds of the royal palace of Caserta, and witnessed by more than 2,000 spectators. General Joseph T. McNarney, Commanding General, Mediterranean Theater of Operations, United States Army, attended the ceremony, along with other top-ranking theater officers. The citation accompanying the award said in part that largely due to Louis' common sense, quick and sound judgment, all correspondence passing through the message center of the Allied Commission was moved smoothly. He was praised as being one of the ablest of the junior American officers. Louis has been overseas for 24 months and wears the American Defense Ribbon and the Mediterranean Theater Ribbon with two battle participation stars. Before joining the Army, he was with Standard Coated Products division of the Interchemical Corporation, New York City, N.Y.

Bob Roulston, a major, dropped in on us a short time ago. He is returning to civilian status after doing his bit for Uncle Sugar and is planning to join the Scovill Manufacturing Company of Waterbury, Conn., as a liaison agent between sales and production. He mentions that while he was in New York he visited with Jack Colby '35, who has spent some time overseas for the Office of Strategic Services and had quite an interesting story to tell of working with the French underground. Bob also said that he had run into Phil Kron out at Wright Field, and he appeared to be just as chipper as ever. Phil expects to doff his uniform soon and will return again to Eastman Kodak in Rochester.

Ben Salmon has made a notable achievement in the field of aeronautics. He is the designer and developer of one of the most unusual planes in the world — the Ryan F R-1 *Fireball* Navy fighter. Eight years ago, Ben laid out the revolutionary two-engined P-38 *Lightning* fighter. His latest plane has two engines but of radically different types. The forward engine is a conventional 1,350 horsepower Wright Cyclone; and behind the pilot in the tail end of the fuselage is a powerful General Electric jet engine for extra bursts of speed.

Roy Fugal has been appointed manager of the personnel division of General Electric's appliance and merchandise division in Bridgeport, Conn. He was formerly supervisor of personnel in the Bridgeport works. His new appointment entails responsibility through research and planning, to promote, establish, and co-ordinate functional techniques and procedures for increasing the general effectiveness of the personnel development and labor management relations in all the plants of the division, as well as the new plants which will be added as decentralization advances.

Ray Levine, an Army lieutenant, was recently married to Miriam Gorfinkel, daughter of Meyer L. Gorfinkel of Brookline. Jim Eder has also taken unto himself a bride. She was Mary Hughes, daughter of Tallmadge C. Hughes of Detroit. The wedding took place on September 14 in the Dutch Reformed Church in Hopewell, N.Y. — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, 169–49 24th Avenue, Flushing, N.Y.

1937

These last two or three months and the next several months to come will probably see a great change in our Class: dozens of fellows will be getting out of the Army, Navy, Marines, Coast Guard, and many other government services; dozens of others will be changing jobs for their own betterment; and still more, like myself, will be changing from force of circumstances. Perhaps even Phil Peters will get out of that uniform he's been wearing since I don't remember when. When I talk about what happened to our company, I have to restrain myself considerably to protect the family and me from a first-class, all-inclusive libel suit. Briefly, the parent company decided that they needed the capital of our company to expand the operations of their regular line and that they needed it in 30 days; so the entire operation was wiped out and everything sold in no time at all. The only difficulty with that was that everything was sold piecemeal, the organization was completely disbanded, and we all went our ways. We all think that we were not given a proper chance since our record of production was exceptionally good. Our costs were lower than others, and we had good postwar products. Now I am following some of these myself and hope to market them soon.

I have quite a stack of material here this time because so much has happened since the last time. The top item dates back to June 23, when the stork pulled a fast one on Arthur and Mrs. York, who at that time were stationed in Washington. They had had printed a very clever card, patterned after Ripley's "Believe It Or Not" and beginning, "There's a New York in Washington." But Mr. Stork, knowing nothing of these preparations, necessitated some last minute changes in the cards by bringing two girls, named Anita Colette and Rita Annette. Congratulations are also in order to Erdine and Rolf Schneider on the birth of a daughter, Deirdre Gail, on August 9. They are living at 70–35 Broadway, Jackson Heights, N.Y. Norm Robbins wrote in September that he and Chris were expecting to come to New York and Massachusetts during October; later we heard from him that the trip was temporarily delayed because of the uncertainty of the gasoline supply and finally abandoned for the time being, because of affairs at the Consolidated plant and an impending addition to the family, their first so far as I can determine. His first letter reports: "The end of the war has left my status unchanged as chief structures engineer, which is a fair-to-middling break. We are going ahead with . . . production and have a new model in the offing. Since the Army and Convair are apparently coming to terms on a plan to continue operations in Fort Worth, we seem to be here to stay. My feelings are mixed, but I can't complain."

Gil Mott, a Navy lieutenant, has written us in his usual excellent style: "For a year or two I have felt that I owed you a letter — I don't quite know why, since my only correspondence from you has been those teasing postal cards you occasionally send out in an effort to drum up some copy for The Review. But your name came up during dinner, and I finally decided to ease my conscience. One thing that may have kept me from writing earlier was the thought that since I might be quoted, I was obliged to polish my phrases and exercise unwonted care in my grammar. Kindly edit anything that a famine of material forces you to use. [Just listen to him rave — would that there were more like him!] As you should know from my Christmas cards, I am living with Bill Tier '36, who confesses to having been good friends with you at the Institute. We chanced this evening to be discussing some of your more prominent characteristics — what a 'brown-bagger' you were, and so forth. [How bald I am, too?]. I've been a dry-land sailor here at the Naval Ordnance Plant, Center Line, Mich., since March, 1943, my only other Navy duty having been a six-weeks' indoctrination course at Fort Schuyler in New York. I must say it's been a pretty pleasant two and a half years. My work at the plant, which is Navy-owned but operated by Westinghouse under contract, has been concerned with engineering and production on the 20-millimeter gun and mounts. This experience has given me an education in a phase of manufacturing previously foreign to me. We live in bachelor officers' quarters right here on the plant grounds, and they're very comfortable indeed. There are about 15 officers, only four of whom are bachelors. Most of the others live with their families in other houses on the station, making all together a pretty congenial group. The only disadvantage is that we're way out in the country, about 12 miles from downtown Detroit, and without a car social life is a bit difficult. The liveliest topic of conversation in the Navy at present, of course, is points. I have only 30 of the necessary 49, and it looks as though I'll be in for the better part of a year, barring unexpected changes in policy. My recent contacts with Technology classmates have been as follows: I met Charley Gadd the other night while we were both having a look at a submarine which was on exhibition in Detroit. He is still with the General Motors research division. He has been principally engaged in general strength studies associated with the development of engines and vehicles, and in conjunction with two of his junior associates, has presented a paper before the Western Michigan section of the Society of Automotive Engineers on June 15. The title: "Correlation of Stress Concentration with Fatigue Strength of Engine Components," published in the S.A.E. *Journal* for November. A week or so ago in Cleveland I ran into Dave Fulton, who is still with Lummus and doing well. In Muskegon, a few months ago, I met Martin Kuban, who's with Bosch machine tool. Cliff Lytle, a first lieutenant, is still in the Army, in Springfield, and has two children. Max Jacobs, who was married not too long ago, is practically running Jacobs Brothers in Brooklyn. As you know, Max Kendzur has

been missing in the China-Burma-India theater since June, 1944. Max was my roommate and a very close friend, and it's still hard to believe he's gone. . . . If you ever get to Detroit, the number is PLaza 2870." Thanks Gill! See what I mean, fellows?

Leonard and Mrs. Seder were also visited by the stork on May 17; their daughter's name is Judith Roberta. Edgar C. Rust, Jr., is administrative assistant to the vice-president in charge of engineering at Bell Aircraft, Niagara Falls, N.Y. The Navy has given its Distinguished Civilian Service award to Joseph F. Keithley, who lives at 3868 Carnegie Avenue, Cleveland 15, Ohio. This is the Navy's highest award to civilians, and we should like to know more. How about it, Joe? We hear also that Henry Stuart, a major, has returned to his old home town of Canton, Mass., after three years in Europe with the Second Armored, "Hell on Wheels" Division. He was awarded the Bronze Star and has chalked up an enviable record, one episode of which we described in an earlier issue of The Review. He is spending his terminal leave with his charming wife, Mildred, at his parents' home. J. R. Fitz-Hugh is heading a new department of economics with the Carter Oil Company, Tulsa, Okla. Bob Fischel, who is a lieutenant colonel in the Air Forces at the Dover Army Air Field, expects to be eligible for discharge soon. He has been in for more than four years and is quite eager to get back into the swing of things. Among the first American officers to enter Japan was Joseph A. Smedile, a lieutenant colonel, who landed at Atsugi airdrome near Tokyo before V-J Day. With the forward echelon of Lieutenant General Robert L. Eichelberger's Eighth Army Headquarters, in which he is serving in the engineer section, he flew from Leyte, P.I., in mid-August to Okinawa, where he waited during the surrender negotiations. He previously participated in the Guadalcanal, Biak, Leyte, Palawan and Zamboanga campaigns. That's quite a bit of action, Joe; do you have anything you want to tell us? Charles E. Reed is the manager of a new department of the General Electric Company's Pittsfield plant, the chemical engineering department. Dr. Reed is responsible for supervising the development of chemical processes and the design of chemical plants for G.E. — WINTHROP A. JOHNS, *General Secretary*, 34 Mali Drive, North Plainfield, N.J. PHILIP H. PETERS, *Assistant Secretary*, 159 Glen Road, Wellesley Farms 82, Mass.

1939

Gordon A. Pope, a major, recently was high point man of a group of veterans on the transport *General McCrea*, arriving in New York on October 15. He had 237 points after spending four and one-half years overseas with British, American, and Chinese armies. Gordon, who returned in command of 200 paratroopers, holds the Silver Star, Purple Heart with two clusters, Croix de Guerre, British Military Cross, and three presidential citations. He served with the first infantry division, the 235th Combat Engineers, and the office of Service of Supply.

Another high point man mentioned in the Riverhead, N.Y., *County Review* is Edgar F. Smith, who will soon return to civilian life. Captain Smith was called to active duty in December, 1942, and acting as assistance intelligence officer in the Engineer Section, he helped compile data concerning enemy engineer equipment. After joining the First Army in September, 1943, he edited the booklet, *Mines and Charges Used by the German Army*, later distributed to all branches of the Army. He wears the European Theater Ribbon with five battle stars for the campaigns of Normandy, Northern France, Ardennes, the Rhineland, and Central Germany during his service with the First Army. Before coming into the Army, Edgar was assistant sanitary engineer for the Albany district of the New York State department of health. After his discharge he plans to study for his master's at Technology.

On October 7 of this year Charles S. Wetterer, a lieutenant colonel, was separated from the service after having been chief of the operations section at Asheville, N.C., Army Air Forces Weather Wing. Charlie completed five years of active duty with the weather service and served a total of 33 months overseas. He spent 13 months in Bermuda, followed by 20 months as sub regional control officer in the Mediterranean theater of operations during the campaigns in Corsica, Sardinia, Sicily, and Italy. Before entering the service, Charlie was engaged in the building construction business in Melrose, Mass. — STUART PAIGE, *General Secretary*, 88 Van Giesen Street, Richland, Wash. ROBERT C. CASSELMAN, *Assistant Secretary*, 271 Cypress Street, Newton Center 59, Mass.

1941

Many of you are asking when your Secretary is going to wake up and realize that the war is over. The fact of the matter is that we have had an accumulation of news of men at war which we hope is of interest to the uncomplaining readers of this column. In regard to complaints — we should welcome a few. Knocking out a column for four years without squawks is an unhealthy state of affairs. In short, with the driving force of the recently terminated world conflict removed, there should be a little more leisure for '41 men to sit down and drop a line as to their activities or plans for the future.

A note from Warren Meyers indicates his increased activities in Navy terminations at the plant of the T. A. Edison Company in West Orange, N.J. Ivor Collins was feeling a bit badly because he has lost touch with most of the gang — Ivor was out near Honolulu shortly before V-J but no doubt has left by now. We've had a hard time keeping up with all the social news during the war and expect that things will pop even faster now that the boys from the European and Pacific theaters are returning. John A. Stern, a lieutenant commander, and Elizabeth I. Hindson were married in Wickford, R.I., late in October. Lieutenant Robert Mellen, U.S.N.R., and Lieutenant (junior grade) Elizabeth Callahan were married at the South Post Chapel, Fort Myer, Va. We received a note concerning the engagement of Elizabeth Elley to George Newton; George is with Sperry Gyroscope in Long Island, N.Y. Dorothy Anne Forrester is engaged to Bob Wooley; Bob's father is Brigadier General Wooley of the Seventh Army. Joanne Mayo and James Cooney were married early this year at Plandome, L.I. Commander Jack Obermeyer who took graduate work at the Institute in 1941, is engaged to Joan Dotson, a junior grade lieutenant in the Navy Nurse Corps. Our sincere wishes for a bright future in a peaceful world are enclosed herewith.

We received an interesting story of Pierre Hartshorne, an Army captain, meeting two of his buddies from Wakefield, Mass., out in the Philippines. Pierre spent a few days of leisure after graduation from the Institute and then entered upon a very interesting career in khaki. After officer's training at Fort Monroe, Va., he had his first tour of duty at sea as an armed guard. You may recall our telling how we bumped into him at the New Orleans port of embarkation directly after a Jerry sub had dumped him into the Atlantic. After further training at Camp Davis, North Carolina, Pierre began his tactical service with the ground forces, which carried him to several stations in the States and finally to the Pacific, where his first stop was New Guinea, in September, 1943 — thence up into the island of Leyte, whence we received the news release.

Another story comes through about Arthur Walsh, a captain in the Air Transport Command, who recently received a commendation for the part played in elimination of a 500-ton backlog of vital cargo which was to be moved up by air transport to the China-Burma-India theater. An interesting side light on overseas packages comes from the experience of David Fish, a lieutenant colonel, who studied meteorology at the Institute in 1941. Colonel Fish was stationed at Biskra, Algeria, engaged in forecasting for bomber strikes against such high priority targets as Bizerte, Tunis, Tripoli, Palermo, Naples, Rome, Messina, Marseille, and Pantelleria. The people back home persisted in sending gift packages of dried fruits, mainly dried dates — most of which were originally picked, packed, and marked in Biskra before shipment to the States.

Returning from the Office of the Quartermaster General the other day, we met former Commander, now Mr., John Ludwig in the Pennsy diner. John had been stationed at the Naval Office of Research and Inventions during the war and had a list of contacts: Joe Gavin, a senior lieutenant, in fighter design at the Bureau of Aeronautics; Ted Guething, a senior lieutenant, in power plant design; Ted Walkowicz, a major, in glider inspection at the Pentagon Building; Connie Nelson, an Army lieutenant, at Wright Field, back from the European theater; Ray Fernandez, a senior lieutenant, in power plant design at the Bureau of Aeronautics, along with Basil Staros and Ray Berry, a captain; Ray Krieger, at Glenn Martin, Baltimore; Sherman Crites at Pan-American Airways, La Guardia Field, N.Y.; Reeve Morehouse, a lieutenant, at the Office of Research and Inventions, to be a civilian by the first of January; Ed Hardway, out of the Navy after doing some fancy inventing as mentioned in this column some time back; Quentin Wald, assistant chief engineer at Sikorsky Aircraft (helicopters); Elmore Pillsbury, chief of stress analysis, Fleetwings Division, Kaiser Cargo, Inc., Bristol, Pa.; Dick Herr, a junior grade lieutenant, Naval Office of Research and Inventions;

Frank Kolk, a project engineer at American Airlines, La Guardia Field, N.Y.; and finally Payson Sung Tseu, back at the Institute. Ludwig astounds us with his memory. — STANLEY BACKER, *General Secretary*, Philadelphia Quartermaster Depot, 2800 South 20th Street, Philadelphia 45, Pa. JOHAN M. ANDERSEN, *Assistant Secretary*, Saddle Hill Farm, Hopkinton, Mass.

1942

Although quite a few of the fellows are being discharged from the armed forces, news is still coming in at a rapid rate concerning promotions, service awards, and other pertinent data concerning fellow classmates in the war effort. We find that Charlie Dodson is a lieutenant in the Naval Reserve, flying a Navy Hellcat. Although this may be rather old news to some of us, he was credited with sinking a Jap cargo ship without heavier armament than his machine guns. At the same time we find that Charlie is married and the father of a six-months-old daughter. William Muir has been serving with the "Long Rangers" heavy bomber group of the 13th "Jungle" Air Force. Bill was assigned there as an aerial radar countermeasures observer on B-24 Liberators. From Austria it is reported that Charlie Steele has been promoted to the rank of major and is now wearing the oak leaf in addition to four battle stars from three different war theaters. Another major is Ken Rosett. Ken likewise is wearing a chestful of campaign stars from three or four different theaters. Bill Dennen may be reached on Guam. It seems he is the operations assistant for the Army Antiaircraft group located there. Jim Littwitz, who has spent well over three years as a member of the Chemical Warfare Service, has accepted a position with Eastman Kodak Company, Rochester, N.Y.

A few more weddings and good intentions should be listed at this point. Albert Downing and Bettye Murphy were married at the Base Chapel at Bowman Field, Louisville, Ky., on July 31. Al has just returned from the Pacific theater after two years of duty and is now wearing a bronze oak leaf. Dean Lewis and Ellen Parkhurst were married on October 7 and plan to live in Chevy Chase, Md. Evidently Dean has still some service in the Navy and is at present wearing ensign's stripes. Walter Kneeland was married on October 28 to Dorothy Walters of Melrose. At least one of Walter's classmates was there to bolster him up — Dick Barry, as an usher. Walter is back at the Institute trying to get some sort of degree in Chemical Engineering. Bill Hamlin, now a lieutenant in the Army, was married to Lucy Corbett on September 8 at the Fort Washington Collegiate Church, which is up the river from New York City. Owen Welles and Marjorie Seidel were also married on September 8. Owen is at present an engineer with the Pratt and Whitney Aircraft Company. The wedding took place in the Larchmont Avenue Presbyterian Church in Larchmont, N.Y. — Dick Haven and Betty Brace have announced intentions without any definite date. Dick must be having trouble getting out of the Army. Joe Rivers, whom most of us remember as a graduate student when we were undergraduates, was married to Maxine Dodge on September 15. The following couples have likewise announced their engagements — Allen Macnee and Lois Livermore, Jack Williams and Mary Sheehan.

For the last two or three weeks the Institute has been reminiscent of 1941–1942. Many, many familiar faces have been wandering in and out of its portals. In the midst of these was Charlie Stempf, who was to be found one fine morning sipping a coke on one of the Coop's well-known fountain stools. He is being processed for immediate delivery by the Navy to civilian life and is looking forward to three or four months of delightful loafing somewhere in the wilds of New Hampshire. He reports having run across Paul Bruckmann and Frank Seeley, the latter of whom is proving highly prolific, now having sired at least two offspring. Hawk Shaw has received his M.D. and is now 36 on and 36 off. Ah! for the life of an interne.

Bill Rote wandered into the office the other day and reported that for the last three or four years he has been sweating it out at Fort Williams just outside Portland, Maine, with an occasional side trip to Canada. He is wearing captain's bars, has acquired a wife and a baby girl plus a place to house them on the Post. Just wait till he gets back to civilian life and tries to find a house large enough for three people. Bill reports that Barney Ring is still in the Navy as a radar officer. Evidently Bill has been around somewhat more than he admits because he also reports having seen Bob Secord and Baresel. The former is married and has been in the Pacific for quite some time. The latter has been teaching in Fort Monroe, Va. J. J. Quinn must have been doing a lot of traveling recently. Only a month or so ago he was heard from on the West Coast, and just a week ago he called up to say he was at the Institute, but wouldn't have time to stop in and say hello personally.

Quite a few of the fellows are actually back at the Institute as students, either as civilians taking graduate work or brush-up courses, or as Army and Navy personnel assigned to the Institute for special courses. Among these we have seen the following: Moe Steinberg, Charlie Ruckstuhl, Walter Kneeland, Bill Kellogg, Ed Thode, Tom Crowley, John Carleton, and Mike Frueh. Bill Kellogg has enough decorations on his chest to provide one apiece for everyone in the Class if he were to share them. S. YOUNG TYREE, JR., *Assistant Secretary*, Room 2–215, M.I.T., Cambridge, 39, Mass.

1943

During the last few days I have been at the Institute and have picked up the following bits of information. Dick Haas has been released from the Army and expects to go to law school at Columbia in New York. Cal Dunwoody is planning to return to Technology for a master's degree in — guess what? — Course XV. Dorothy and Rube Meyer are now father and mother, and no further details are at hand. Charlie Crocker was relieved from active duty a few days ago, and incidentally so were Steve Steen and I. Sydney Crook is working for his doctorate, for which he hopes to qualify this summer. George Schudel is also at the Institute and is, among other things, an instructor in freshman chemistry. Simon Gluck, a junior grade lieutenant, is still aboard the U.S.S. *McDermut*, from which he saw the entry of the Fourth Fleet into Ominato Bay, Japan. Before witnessing this spectacle, the *McDermut* was in waters near Okinawa rescuing downed pilots, and a little later, was a member of the Ninth Fleet, which took part in the bombardment of Suribachi. This latter was one of the last engagements of the war. Another sailorman, Commander Carl Hirschberger, is now on duty in Charleston Navy Yard. Carl was graduated from the Naval Academy at Annapolis and came to Technology for graduate work. He has seen action at New Guinea, Borneo, and the Philippines. His last sea duty was in the U.S.S. *Boise*.

Another old salt, Bob Rorschach, a junior grade lieutenant, has written: "My ship has just returned for the fourth time from the western Pacific, bringing men from the Philippines, New Guinea, and the Admiralties. There are still many men waiting to come back, so we shall probably be making some more trips, too. My ship, the U.S.S. *Pickaway*, has established some kind of a record in traveling 50,000 miles without ever seeing the enemy, and missing both V-E and V-J days through crossing the International Date Line. It is possible that we may still be at war for all we know! The last time we came to the States, in August, I ran into Fred Hammesfahr '40, and Jim Spitz in San Francisco. They both had just returned from the war and looked fit. According to the way the points are running now, I expect to be out in about six months. When that time comes, I shall head for home and a government financed course in petroleum refining at Tulsa University. By this means I should have a master's degree in the year. At present, however, we are having a great time trying to run the ship with so many senior and experienced men gone. My duties have just about tripled in the past two months, and my head is barely above water." For a Navy man that must be bad!

Cupid scored bull's-eyes for the month when the former Lydia Parker Shaw and Fred Brauer were married in Chichester, N.H., on October 6. Lydia was graduated from the University of New Hampshire, where Fred went after leaving the Institute. At present Fred is a research engineer with the Philco Corporation in Philadelphia. Bull's-eye number two was also scored on October 6, but this time in Charlotte, N.C., at the wedding of the former Ida Claire Purcell, of that city, and Alex Smith. Ida was graduated from Agnes Scott College in Decatur, Ga., and until her wedding was secretary to the president of Queens College in Charlotte. The Smiths will make their home in Baton Rouge. Cupid has taken aim a few times, too. From Gorham, N.H., we hear that Barbara Warfield and Fred Row are engaged. Fred was recently discharged from the Army. Joyce Kennedy and Ed Mikolajczyk, a corporal, will be married soon. Joyce's home is in Portland, Ore. Ed has recently been home from France on a 45-day furlough. Finally, Dorothy Mahoney and Scott Libbey, a first lieutenant in the Army, also plan to become husband and wife. Dorothy is a script writer for radio station WNAC, and Scott is in the Army Ordnance Department.

And so we come to the end of the class column for this month. As more members

of the Class don civilian clothes, and A.P.O.'s and F.P.O.'s become memories and no longer addresses, I hope to circularize the Class to bring the records up to date. I am open to suggestions as to how this may best be done. — CLINTON C. KEMP, *General Secretary*, Barrington Court, 988 Memorial Drive, Cambridge 38, Mass.

1945 (10-44)

It seems as if there were as much of our Class at Tech now as when we were graduated a year ago last October. Among the familiar faces returned to the Institute are those of Harold Steiner, who says he was in the same German prisoner-of-war camp with Art Wong, after the B-17 of which he was a bombardier was brought down over Germany, and Robin Steven, both back in the folds of Course XVI. Carl Dengler has also been seen roaming the halls of M.I.T. as a student.

We regret to announce that Lieutenant Richard H. Bresler was killed on July 8, when a new P-51 which he was flying to India crashed as he was bringing it in.

The ranks of bachelors in our Class are being rapidly depleted. Paul Dennehy is engaged to Marguerite E. Guillet of Sharon, Mass., a Boston University graduate. Gabriel de Roetth is similarly affiliated with Mary-Elizabeth Field of Fall River and Simmons College. Also engaged is Richard Hinchcliff, to Esther May Bertolet of Melrose Park, Pa. Paul is now working for the Washington, D.C., *Times-Herald* on its photographic staff. Gabe is 'working' for the Army in Tooele, Utah. Dick is an ensign at the Anacostia Naval Air Station, Washington.

J. Gordon German, a sub-lieutenant in the Royal Canadian Naval Volunteer Reserve, was married in Newton to Helene Estelle Sawyer, who was graduated from the Boston School of Dental Nursing. The Germans plan to live in Ottawa, Ontario. — Pol G. Boel has left his job with the American Steel Foundries to return to Belgium to join the Usines G. Boel steel mill and foundry in La Louvière.

About two months ago your angelic Assistant Secretary sat down in a New York subway to hear a voice, "Pardon me, but didn't you go to M.I.T?" coming from Sergeant Joe Kelly. Joe is a radio operator in the Air Forces, formerly on a Liberator in England, now on tentative assignment at various bases in the States. He has been teaching a physics course at his latest field. His presence in New York was prompted by Elly Mann of Staten Island, a Wheaton College graduate, to whom he is engaged. Joe takes a sort of pride in the fact that he sailed for England on the day his engagement was formally announced, last Easter. He expects to be back at Tech in March or July.

A letter from Jim Healy brings the word that he has seen a lot of the Pacific together with Frank Nolan. In San Francisco they encountered George Hetrick, Julian Busby, Greg Walsh, and Lou Zirin. Jim ran into Mal Crowther in Pearl Harbor, where the two spent 'a good deal of time just sprawling on the beach collecting a Hollywood sun tan.' At Hawaii he saw some more '45 in the forms of Abe Porson, Ole Swensson, Bud Bryant, Lew McKee, and Bill Kalb. From Pearl Harbor he went to Samar and China, via Johnston, Kwajalein, and Guam islands. — JAMES S. MULHOLLAND, JR., *General Secretary*, 1172–77th Street, Brooklyn, N.Y. *Assistant Secretaries:* RODERICK L. HARRIS, 1 Winchester Street, Brookline 46, Mass. JAMES B. ANGELL, 530 Beacon Street, Boston 15, Mass.

1945

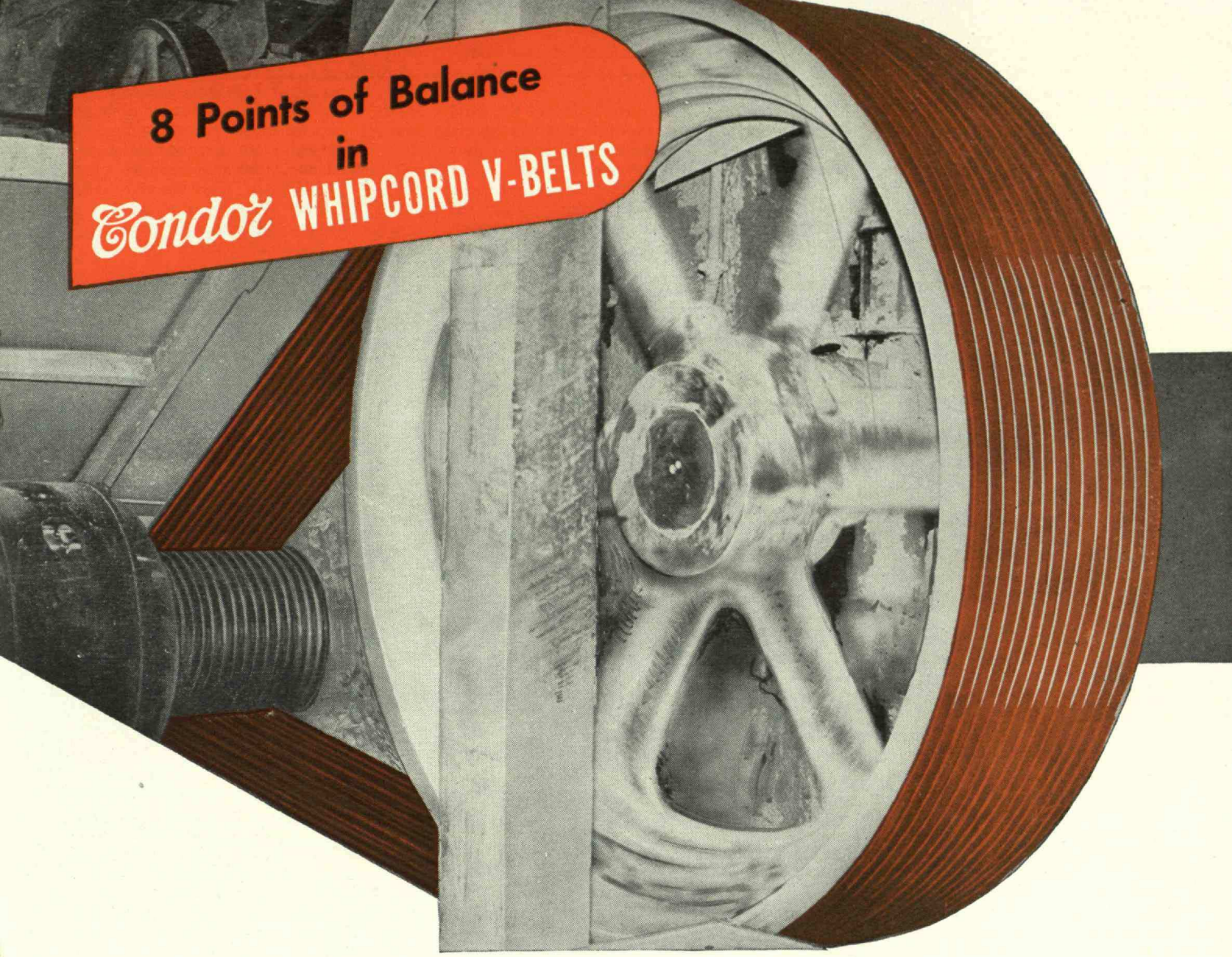
It seems we were still celebrating our "release" from the dear old Institute when the last issue of The Review went to press. As a result, this is our first opportunity to chat with each other; so let's make up for lost time.

Our eminent President, Kirk Drumheller, was here not long ago with Dave Flood, both adorned with gold braid. They mentioned something about going west, but seemed perfectly happy about the whole thing. Perhaps that is not the right thing to say, but it may bring a reply so we'll have something to write about in the next issue. I saw Hoaglund the other day. Believe it or not, he is being sent to Harvard to the supply school. I'll bet it's an awful letdown. He was kind enough to jot down some odds and ends, which follow here.

"At Hewson's insistence I am required to display my class spirit by giving some account of the Navy members who left the halls of Technology for midshipmen's school at Columbia University. I am reluctant to undertake this because, of the hundred or so of us from the Institute, I know the experiences and whereabouts of very few. Let me apologize now about those who are left unaccounted for. We will all stoutly maintain that Columbia midshipman's school was about the roughest treatment yet experienced by gallant V-12 men serving their country. Double time, demerits, extra duty, chest out, chin in, reveille at 5:50 A.M., marching, marching everywhere, daily quizzes that had no answers, trees, bushes — violines — these were but part of it. Some fell by the wayside, but darn few. Winner of the 'tough' medal is easily Bob Birkhoff, who was presented a ticket to Great Lakes because of poor eyesight. The Navy needs physicists, they tell us. Most Tech men just couldn't let the old school down and came through ranking well up in the top percentage of the Class. Bob Maglathlin stood number one in Ordnance and number three in the class of 1,127. Dick Battin, Dave Trageser, Hal Thorkilsen were all right up there. Many others were, too, and I regret I can't mention more names but I learned these standings only by word of mouth. Well, so it went. Most of us are going to sea at long last. Transports and battleships, down to small patrol craft, will all be blessed with mighty men from Tech. Oh, yes, some of us are going back to school again, too — tactical radar, steam school, and last but not least, Harvard Supply Corps School for the blinder members of the Class."

Many thanks, Jim, for your news. Incidentally, Hoaglund didn't do so badly himself as battalion commander at Columbia. Ralph Scherer was at school the other day, bidding fond farewells to everyone before heading for Japan. I've heard it said that Jake Freiberger, with several others, was also on his way there. Reports from south of the Mason-Dixon line show that Jim Brayton and Freiberger have several times been in the vicinity of Lynchburg. More power to you men — I wish I could get there more often myself. On the subject of splicing, Paoli Massaglia married Jean McFarlane on the same day he was commissioned at Columbia. Also, Bob Lohman married Kathleen McCloghrie. Bill Loeb turned up today at school. He was commissioned an ensign in the Navy and sent back here to the Institute on a special project. It sounds like a wonderful deal. Bill Blitzer was around before leaving for tactical radar school in Georgia. Honest to goodness, these fellows who get sent South for the winter are sure lucky. Homer Elliott, Jr., one of our few civilian members is now working for Eastman Kodak as a chemical engineer. Butch Bickford is working at school in the Chemical Engineering Department.

At this point the clippings and scraps of news collected to date are entirely exhausted. It is unfortunate because there are so many with whom we have made no contact since graduation. I should appreciate any news any of you have about any members of the Class. Also, if you ever get to Boston, drop in at Room 3-257. The files are there containing the latest addresses of everyone in our Class. Your criticisms and suggestions are always welcome. Good luck, and so long until the next issue. — THOMAS A. HEWSON, *Acting Secretary*, Room 3-257, M.I.T., Cambridge 39, Mass.



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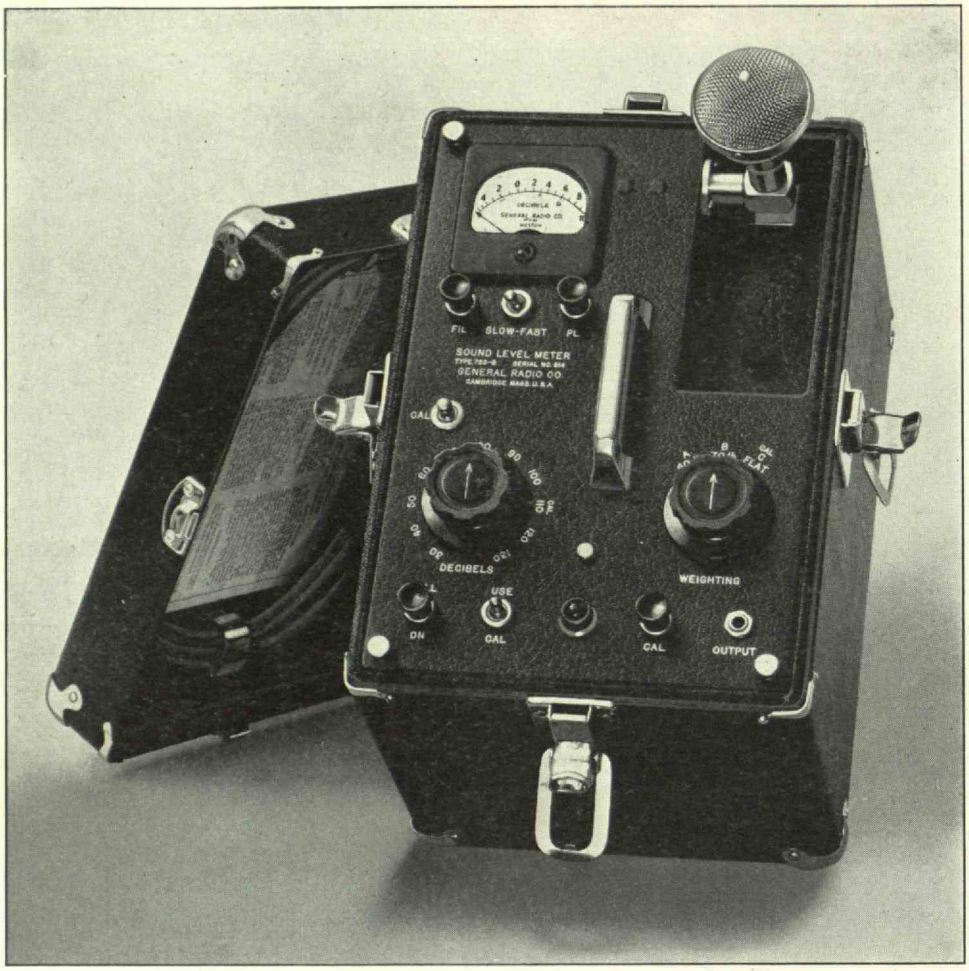
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